pit and quarry

THE BASIC MAGAZINE IN A BASIC INDUSTRY

CEMENT, LIME, GYPSUM, CRUSHED STONE, SAND, GRAVEL AND OTHER NONMETALLIC MINERALS

JUNE 1961

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SEE PAGE 80

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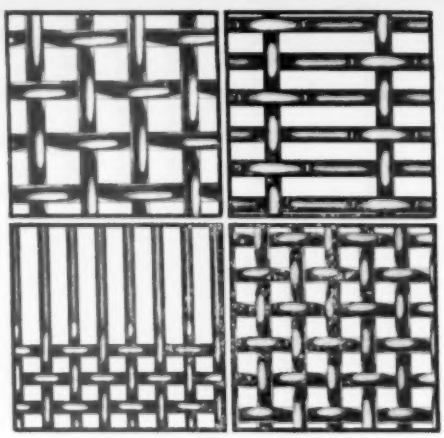

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Enter Cover 2 on card, page 177

Hi-Torque brakes provide positive control as giant Loader lugs 35 tons

The heavy-duty requirements of this CARY-LIFT Loader, made by Pettibone Mulliken Corporation of Chicago, led to a thorough search for the best brakes available. According to the manufacturer: "Exhaustive tests proved to our entire satisfaction that Hi-Torque brakes were far superior to any other type available to us for our requirements."

The brakes on these Loaders provide gentle yet positive braking under all conditions, including operation with very heavy loads in snow, mud, and other adverse conditions. In addition to superior braking power, the manufacturer reports simplified assembly operations through standardization on Hi-Torques.

Investigate Hi-Torque brakes for maximum controllability and safety on your heavy-weight off-road vehicles. Now available on several makes of Loaders, Trucks, Tractors, Scrapers, Mine Vehicles. For information ask your vehicle manufacturer, or write *B.F.Goodrich Aviation Products, a division of The B.F.Goodrich Company, Dept. PQ-6, Troy, Ohio.*

Full circle contact with drum is provided by Hi-Torque brakes giving maximum effective braking surface in the same size unit. Hi-Torque stops vehicles twice as fast as conventional brakes.

B.F.Goodrich **Hi-Torque brakes**

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PIT and QUARRY

JUNE 1961
Vol. 53 No. 12

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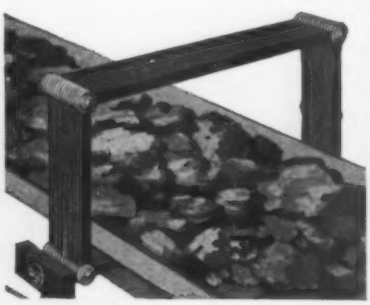

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MARIE E. ANSEL
Assistant Editor

HARRY F. UTLEY
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JON DAY • LORETTA CARLSON
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NEW and OLD
They're TOUGH RIGS!

5-6-20-S

THIS VETERAN and a youngster—two Northwest Model 6 shovels, the newer one in the foreground, swing out 50,000 tons of rock a month. The job is one of Campbell Limestone Company's at the Pelham Pits in South Carolina. But the rock isn't limestone. It is granite! The old Model 6 holds its own and perhaps it is this kind of performance of Northwest rigs that has been responsible for the fact that Campbell Limestone Company now owns its 12th Northwest.

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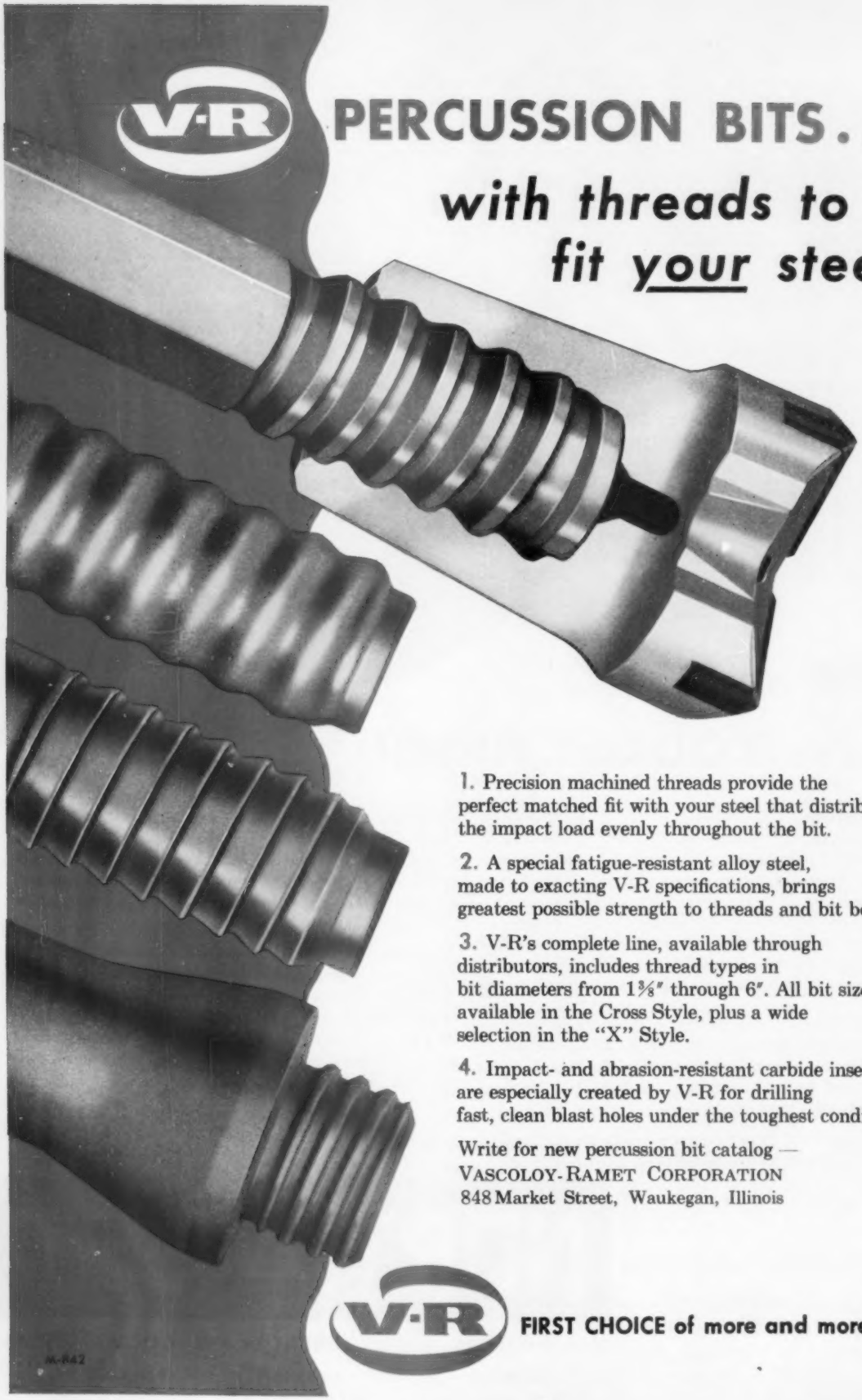

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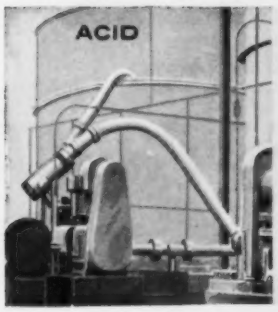

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BOSTON

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How soon do you want these savings?

Super "Tovex" Gel is ready now. Your Du Pont Explosives representative or distributor has it. Call him for further information, or write: Du Pont, 2446 Nemours Bldg., Wilmington 98, Delaware.

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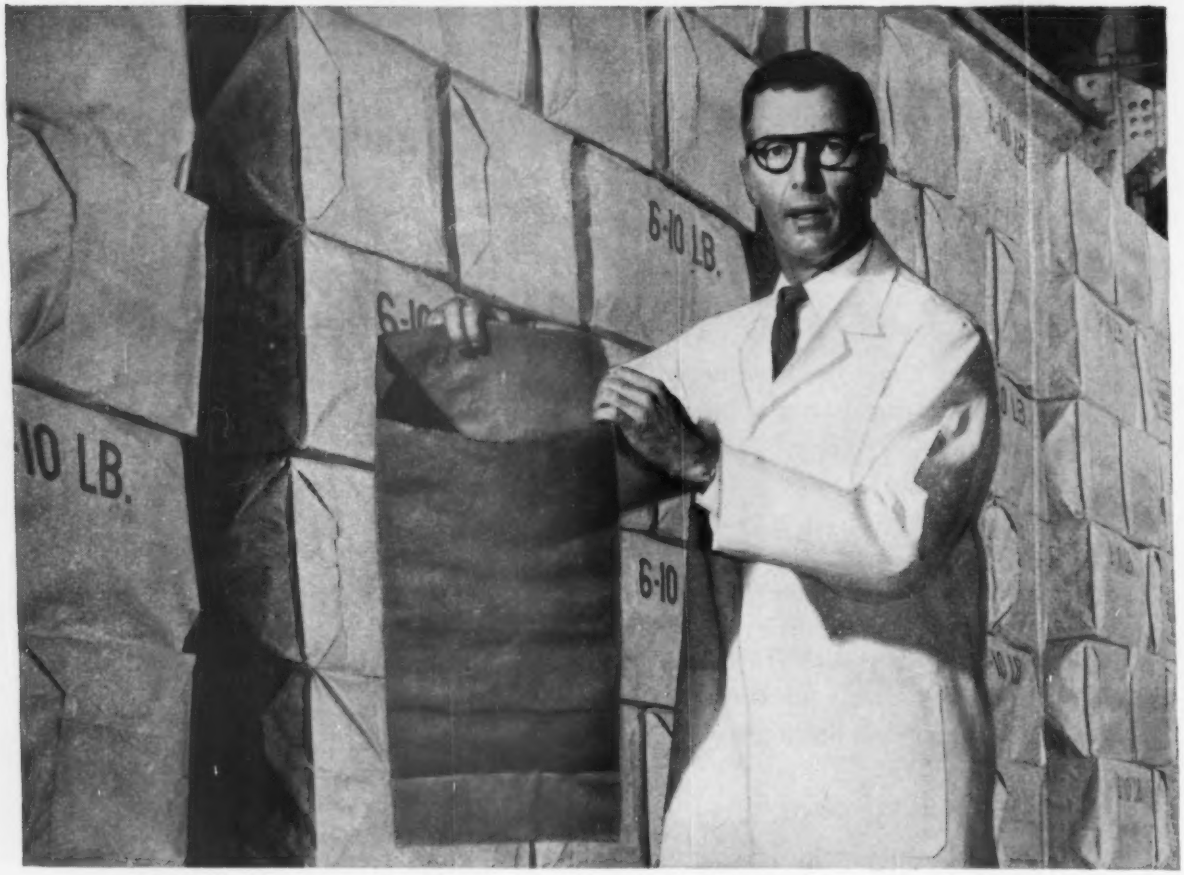

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Washington News Letter

By S. HERBERT UNTERBERGER

DURING his campaign President Kennedy repeatedly stressed the necessity for more rapid economic growth. He did not lack the statistics to show that (1) the Soviet Union's rate of economic growth was far exceeding our own, and that (2) our own rate of growth was slowing down rather than speeding up. Much of this slow-down was blamed on an inefficient use of our resources, both human and material.

With respect to manpower, it was stated repeatedly that each of the post-World War II recessions left a hard core of unemployed and unemployables, and that after each one the upswing was shorter and the "downswing" longer. With respect to the material, it was declared that the modernization of our capital equipment was proceeding at too slow a pace and was in need of much stimulation.

Throughout the campaign there were loud denials but hardly a challenge to the allegedly incontrovertible statistics. Only recently have reputable economists begun to question them. At a recent meeting of business economists held at the University of Chicago, Arthur F. Burns, former chairman of President Eisenhower's Council of Economic Advisers, analyzed these statistical bases and found them somewhat wanting.

On the subject of the lengthening downswing, he found that this had come about principally because the starting point included a period when a downswing was cut short by the Korean War. Similarly, the rising rate of unemployment also resulted from the fact that the measurement began in 1953 which, again, in the opinion of Mr. Burns was an exceptional case because of the Korean War. Furthermore, the declining rate of growth argument takes 1957 as a starting point. He pointed out that if 1947 had been used instead, the opposite conclusion would have been reached.

Other economists at the same meeting agreed with Mr. Burns that the Kennedy case is far from proven. It was generally agreed that the current recession, rather than being one of increased severity, is one of the mildest; and that the problem of recovery is not very different from what is was in 1949, 1954, or 1958. This evidence was used recently by the Republican minority of the Joint Economic Committee, which based much of its report on the Burns analysis.

This relatively optimistic view, however, had had very little impact in Washington, where the pressure on Congress over the unemployment issue cannot be talked away by statistical analysis. Furthermore, in the Washington atmosphere, the recently appointed tri-partite (management, labor, and the public) Advisory Committee on Labor-Management Problems came out of its recent meeting with an apparently unanimous statement that the current level of unemployment is intolerable.

At the moment the latter view is certainly more broadly held than that of the group headed by Mr. Burns. It explains the President's principal congressional successes so far—the passage of legislation to aid depressed areas, to raise minimum wages, and to extend minimum wages to groups of workers hitherto not covered.

On the other front, namely, the encouragement of more rapid modernization of our capital equipment, the Administration so far has offered nothing more than a highly controversial tax proposal. This proposal would provide a sliding scale of tax credits up to 15 percent, depending on how much more a company spent on new plant and equipment than it had set aside for depreciation. The purpose, of course, is to encourage companies to invest more heavily than they otherwise would in newer and better epuipment.

It was something of a surprise to the Administration that this proposal was met with an almost total lack of enthusiasm on the part of the business community. Administration leaders expected, at least, to receive some enthusiastic support from the so-called growth industries. The latter, it was thought, stood to gain most by the adoption of the proposal, since their rapid expansion necessitates, in any event, a rate of capital expenditure in excess of depreciation allowances. Although such support may be forthcoming when the proposal has received more study and is better understood, the very fact that it has been slow in developing raises many questions about its soundness.

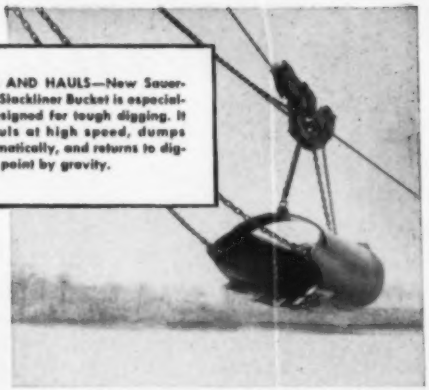
The principal difficulty is the complexity of this tax proposal. The usual comment is that instead of the promised tax simplification, the first substantial proposal is so complex that an electronic computer would be required to figure it out. Other more serious accusations are (1) that it favors growth industries and, in effect, discriminates against the more stable industries which may have an equal or even greater need for plant equipment modernization; and (2) that it makes such modernization depend more on tax advantage than on fundamental economic justifications.

Adding to the disenchantment is the fact that to compensate for the tax loss resulting from such a program, the Administration has proposed the elimination of certain tax privileges dear to the heart of many business men. The most dra-

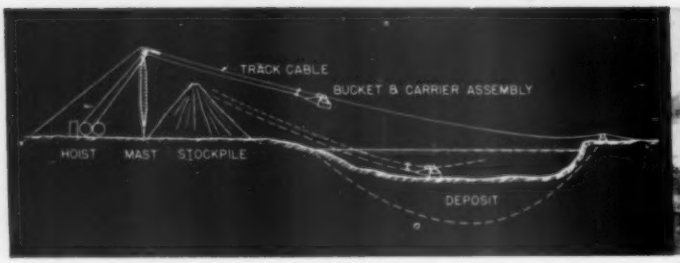
(*Concluded on page 75*)

FROM PIT TO STOCKPILE...

Dig and Haul at Lowest Cost with a Sauerman Slackline



DIGS AND HAULS—New Sauerman Slackliner Bucket is especially designed for tough digging. It inhauls at high speed, dumps automatically, and returns to digging point by gravity.



STOCKPILES MATERIAL—Regardless of long hauls, the Slackline builds a large surge pile to allow charging the plant at any desired rate. Plenty of material is in ready reserve for seasonal or unexpected increases in schedule.

Operating costs as low as 8¢ per yd. for labor, power and maintenance are reported by Slackline Cableway owners when digging free-caving material at average depth and haul distances.

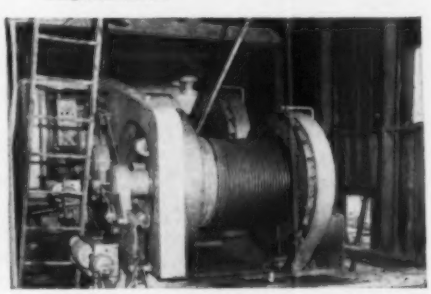
These low costs are achieved by using just one machine—the new Sauerman Slackline Cableway. Multiple equipment is not needed to supply your required tonnage. For example, on an average haul and digging depth, a single medium size machine will charge a 200 tph. plant.

The high Slackline mast permits building a large pile which can supply plant demands through a plate feeder and tunnel conveyor, front-end loader or clamshell. The new Sauerman torque converter diesel-hoist automatically matches power to load demands and is designed for continuous duty. Fluid drive cushions out shock loads to reduce fuel and maintenance costs, extend cable life.

Increasing land values and depleting resources make it necessary to get all the material out of your deposit. You can do this with a Sauerman Slackline. The machine will dig from ground level to deep under water and keep your plant running additional years at the lowest possible operating cost. Several pits are now operating Slacklines on 1000-ft. spans with average hauls of 500 to 700 ft. and from 100-ft. depths.

Write or call, giving your tonnage requirements, depth and length of deposit—if available. We will promptly supply more information on Slackline Cableways, and show you how to *save with a Sauerman.*

CONTROL IS REMOTE, EFFICIENT AND SAFE—Control station can be conveniently located at any strategic point in plant area. Operator can watch entire operation. Fatigue is minimized and personal danger eliminated.



TORQUE CONVERTER INCREASES PRODUCTION, CUTS MAINTENANCE—Now available, the new Sauerman Torque Converter Hoist automatically matches power to load, provides a smooth and steady flow of material, reduces fuel, maintenance and cable costs.

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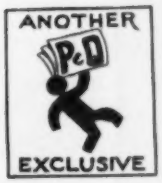
Labor Developments



THE most significant current labor development has been the enactment of the most drastic revisions of the Wage and Hour Law since it became effective 23 years ago. While the increase in minimum wages will have the broadest effect, the severest impact will be in the new areas which the Act now covers.

By S. HERBERT UNTERBERGER

S. Herbert Unterberger and Company
Economists-Consultants on Labor and Industrial Relations
Washington, D.C.-Philadelphia, Pa.

New Coverage of Wage-Hour Law By far the largest new group covered by both the minimum wage and overtime provisions of the law are more than 2 million workers in the retail and service field. They are the employees of retail and service enterprises which meet the following conditions:

1. They must have employees engaged in interstate commerce or in the production of goods for interstate commerce, including handling, selling, or otherwise working on goods that have been moved in or produced for interstate commerce.

2. The enterprise must have an annual gross volume of sales of $1,000,000 or more, exclusive of certain excise taxes.

3. The enterprise must purchase or receive goods for resale that move or have moved across state lines which amount in total annual volume of $250,000, or more.

It is estimated that of the 2,000,000 workers, almost 600,000 will have their wages increased immediately to reach the required minimum. Of course, more may be moved up to maintain differentials with these lowest-paid workers. All will be affected by the overtime provisions as they become applicable.

The next-largest group now covered by both provisions of the law are more than 1,000,000 workers in the construction industry employed by firms engaged in construction and reconstruction, each of which does an annual business of $350,000 or more.

Also, a small number of telephone operators previously exempted will come under the full coverage of the law, as well as a group of workers employed in firms which already have two or more employees covered. This affects mainly firms in wholesale trade, some of whose employees were covered previously while others were not.

In addition, the employees in certain other industries have received partial coverage; that is, they will be covered by the minimum wage but not the overtime provisions. This group includes the employees of suburban and intercity transit lines doing $1,000,000 annual business; employees of gas stations with sales of $250,000 per year, excluding excise taxes; and seamen and employees of fish processing firms operating in interstate commerce.

While the coverage has been extended broadly, however, there are at least 16,000,000 employees not covered. Most of them are in small retail businesses, agriculture, restaurants, and domestic service.

New Minimum Wages For all the employees presently covered by the law, the new amendments require that they be paid no less than $1.15 an hour beginning September 3, 1961, and no less than $1.25 an hour beginning two years thereafter.

For all the above described employees who are newly covered by the law, the amendments require that they be paid no less than $1 an hour beginning September 3, 1961, no less than $1.15 an hour beginning three years thereafter, and no less than $1.25 an hour beginning four years thereafter.

New Overtime Requirements For presently covered employees, the overtime requirements do not change.

For newly covered employees there are no overtime requirements for the first two years after the effective date, that is, until September 3, 1963. For the next year, these employees will receive overtime compensation after 44 hours per week; for the following year, overtime will be paid after 42 hours per week; and thereafter, after 40 hours per week.

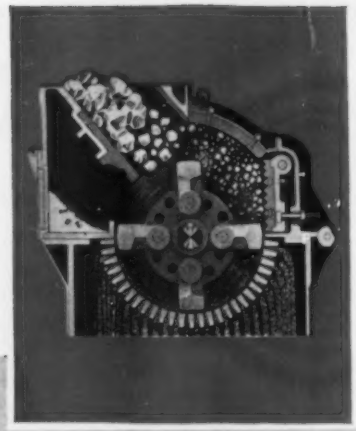
New Board and Lodging Rules Formerly the law permitted the inclusion of the reasonable cost of board and lodging (as determined by the Wage and Hour administrator) in the minimum wage, if such board and lodging were customarily furnished.

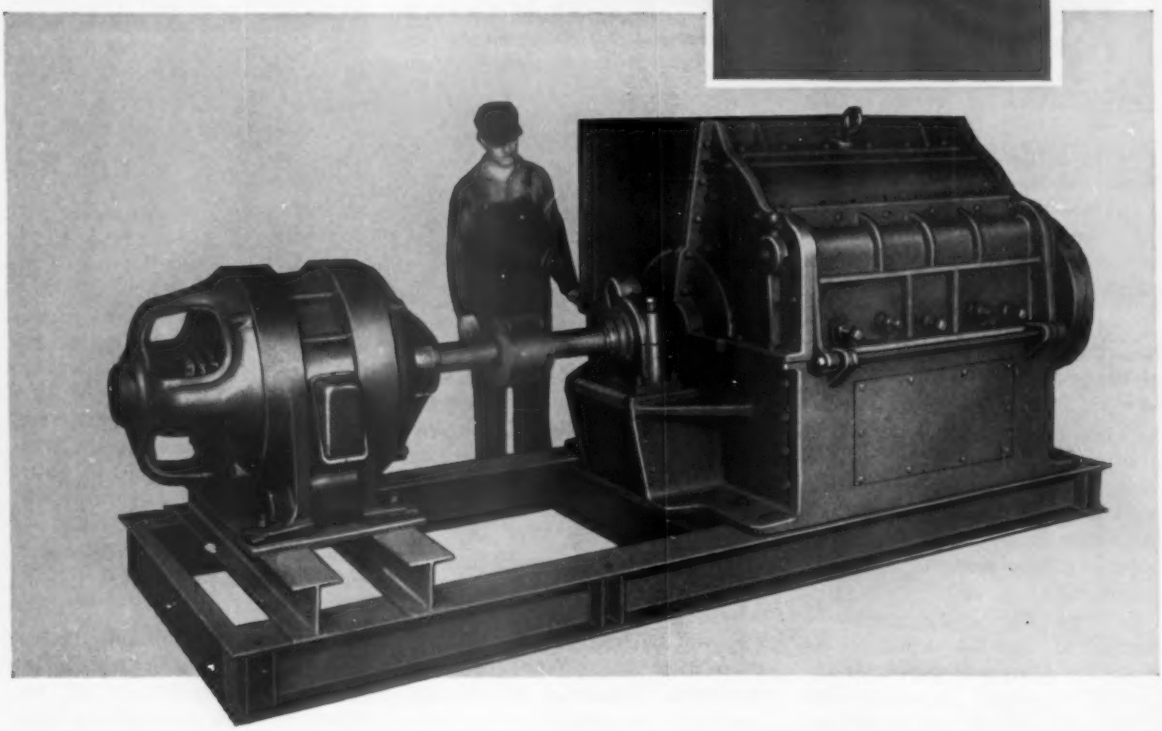
The new amendments modified this provision by providing that the cost of board and lodging are not to be included as part of the wage to the extent that it is excluded by a *bona-fide* collective bargaining agreement applicable to the affected employer.

Foreign Competition Of special significance is the new concern with the impact of foreign competition from low wage areas. This concern is reflected by a new provision in this law. The Secretary of Labor now must initiate an investigation to gain full information if he has rea-

(*Concluded on page 75*)

Complete size reduction... from start to finished product... in a single Williams Hammer Mill





Cut costs as much as 50% on production... up to 75% on equipment

In all normal crushing operations, a Williams heavy duty hammer mill can take most material and, *in a single pass*, reduce it to finished size! Production economies alone, in labor, power, maintenance, as well as stepped up output of better quality and more uniform products, will *cut costs up to 50%*.

Savings in original installations, *as high as 75%*, can also be expected. By making primary and secondary crushers unnecessary, a Williams hammer mill will eliminate all extra conveyors, drives, other equipment, special foundations and additional housing.

Williams hammer mills are built for daily rough and rugged service. Extra heavy manganese steel liners and breaker plates, oversize shafts, massive parts and reinforcements, all defy shock and wear, reduce downtime and replacements to nil.

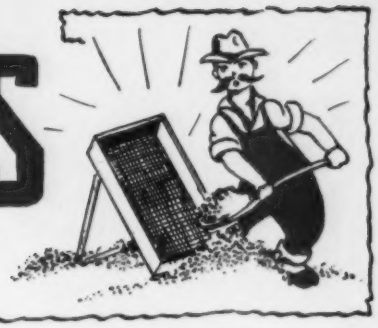
If the cost price squeeze is one of your problems, get the facts about Williams hammer mills. *Write now for catalog.*

WILLIAMS
CRUSHERS GRINDERS SHREDDERS

PATENT CRUSHER & PULVERIZER CO.
802 ST. LOUIS AVE. St. Louis 6, Mo.

Oldest and Largest Manufacturers of Hammer Mills in the World

SCREENINGS



By RAY L. SMITH JR.

OPERATION "clean up your medicine chest" is now in progress . . . in 1959 (the last year for which final figures are available), 1661 persons poisoned themselves accidentally—and fatally. Of this number, 456 were infants and toddlers under five years of age! The home medicine chest should be cleaned out twice a year, destroying all drugs no longer needed or which are past expiration date, changed color, become caked or gathered sediment.

Good Excuse

INMATES at Wisconsin State Prison at Waupun have ordered some potent reading material for their library. A copy of Hurricane Donna in the Florida Keys.

Now, here truly is a group of men who would like a change of climate, do a little traveling and get away from it all.

The Wrong Way

IF YOU'RE one to drink your lunch, and reference is made to a 900-calorie diet rather than the 90-proof, you'll be interested to know that this guck is a real seller.

While users, if healthy, do reap benefit by melting off the lard, the smart fellow is the one who invested in some of the stock a year back.

The best yarn to date is about the woman who used the 900-calorie mash in addition to her regular meals. She gained two pounds a day.

Potpourri and Succotash

Clerk in store: "No, madam, we haven't had any for quite a long time."

Manager (overhearing): "Oh, yes, we have, madam; I'll just send over to the warehouse and have some brought in for you." (Aside to clerk): "Never refuse anything; send out for it, stupid."

As the lady went out laughing, the manager demanded of the clerk: "What did she say?"

Clerk: "She said, 'We haven't had any rain lately.' "

A hillbilly was paying one of his rare visits to town. At noon he went into a grocery store and brought a cellophane-wrapped pie. He ripped off the wrapper and took one crunching bite before he realized the pie was on a cardboard plate.

When he finished the pie he laid two dimes on the counter. "You only owe me one dime for the pie," said the storekeeper.

"But," said the customer, pointing to a large gap in the cardboard plate, "don't you see I damaged your dad-blamed sasser?"

A stenographer was applying for a new job. On her application blank she wrote: "I am throughly familiar with all important phases of office procedure, including bowling, crossword puzzles, coffee breaks, personal letter writing and collection taking."

A little old lady riding on a bus was anxious not to pass her destination. She poked the driver with her umbrella and asked: "Is that the First National Bank?"

"No ma'am," replied the driver. "That's my stomach."

Lost on a back road in Alabama, a young man asked an old farmer the way to Montgomery. The farmer looked down the road, scratched his head and gave a complicated set of directions.

About 30 minutes later after following the directions carefully, the young man was amazed when he came upon the same farmer in the same spot. He pulled up and shouted: "Look here, you act as though you expected to see me again. What's the big idea?"

"Waal, young feller," said the farmer, "I don't aim to waste my time explaining how to get to Montgomery till I found out if you could follow simple directions."

A small boy was ordered by his mother to bring all his cloth animals to the washing machine in the basement so she could give them a badly needed laundering. While she was busy at her work the phone rang and the youngster ran to answer it.

A man's voice asked, "Is your mother at home?"

"Yes, she is," the boy replied, "but she can't come to the phone just now. She's putting an elephant in the washing machine."

There was a long silence on the other end of the line, then the man stammered, "I guess I have the wrong number," and quickly hung up.

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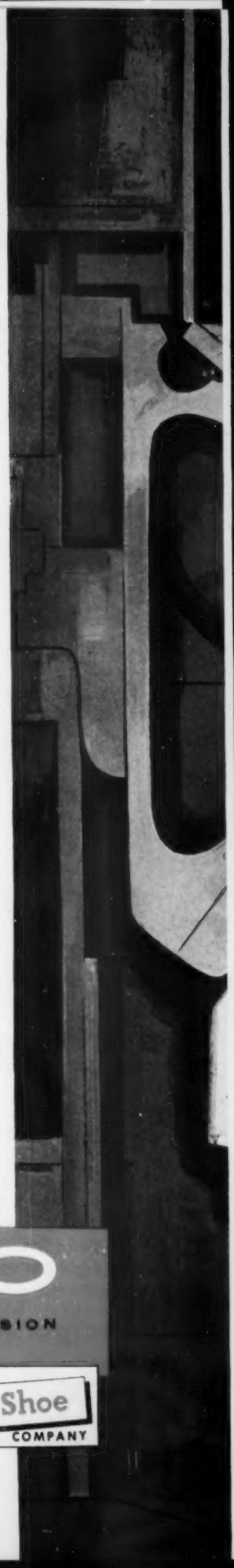


Crush more tons per dollar . . .

BUY REPLACEMENT PARTS FROM THE COMPANY THAT BUILT YOUR CRUSHER

You buy a crusher because of the engineering experience the manufacturer has put into it to give you more production for your money. In the same way, the manufacturer of your crusher buys the experience and engineering abilities of the company which supplies certain components and replacement parts for it. The manufacturer profits only when *you* are satisfied with the performance of his product. That's why most big-name crushing equipment manufacturers work closely with AMSCO to give you replacement parts that fit perfectly, assure original equipment performance, and last a long time in the toughest conditions.

When it comes to wear parts, here's why most manufacturers insist on AMSCO. As long-experienced specialists in wear-resistant metals, AMSCO *engineers* alloys to exact formula needed to stand up under the abrasion-impact-pressure crushing conditions of your job. AMSCO cast parts are structurally perfect and contain the proper alloys for longest possible life.

AMSCO parts are patterned from manufacturer's drawings. They are built for *your* crusher . . . not copied from inaccurate field measurements. When you need mantles, concaves, jaws, rolls, plates or liners, get them from the manufacturer who built your crusher. He depends on AMSCO's experienced way with wear-resistant alloys *to help you crush more tons per dollar.*

They're backed by experience...

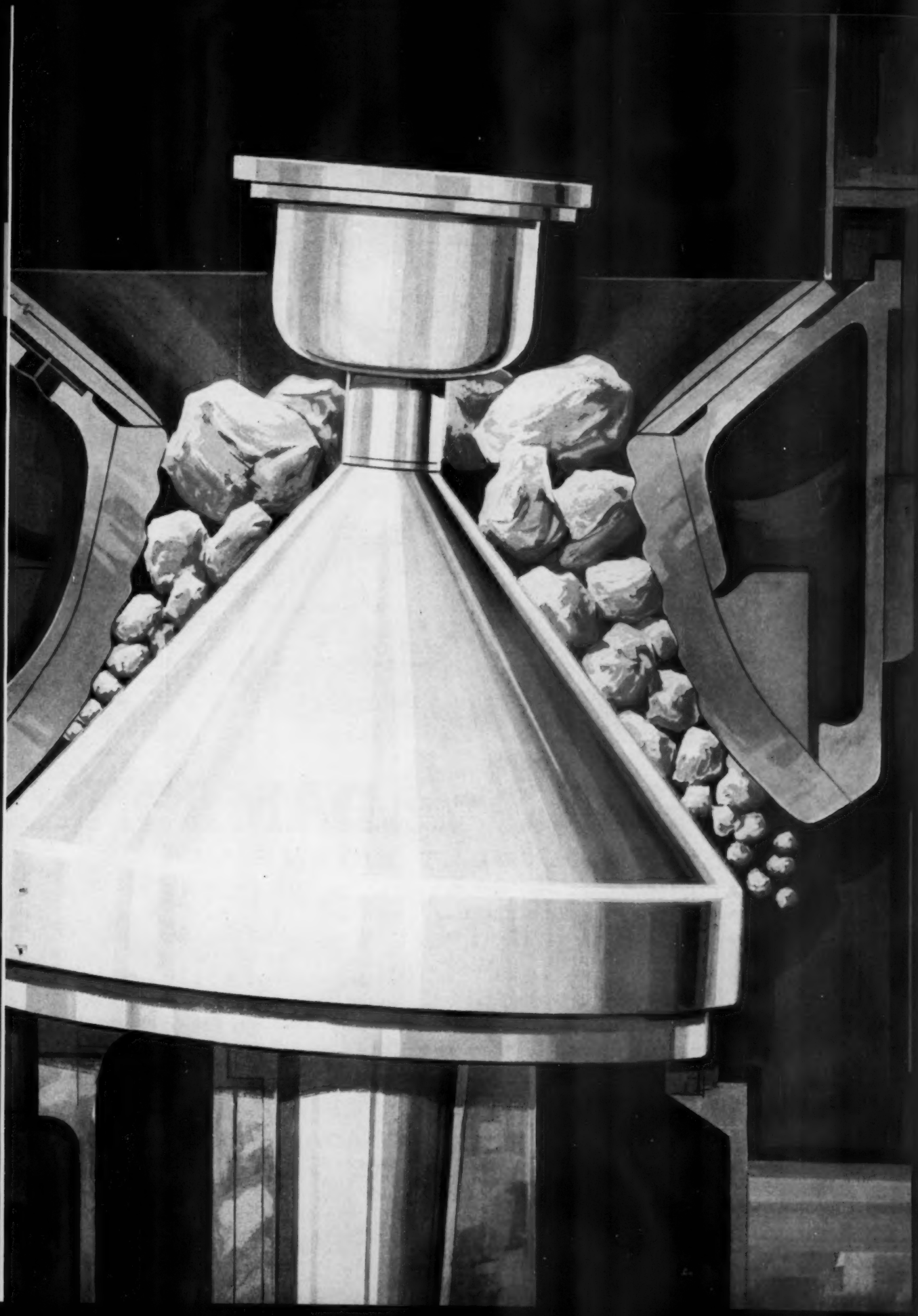
AMSCO

AMERICAN MANGANESE STEEL DIVISION
CHICAGO HEIGHTS, ILLINOIS

AMERICAN Brake Shoe COMPANY

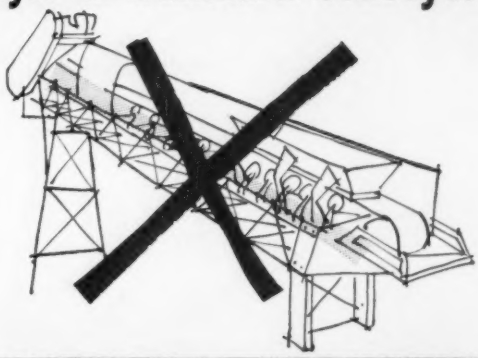
Other Plants in:
Denver • Los Angeles • New Castle, Del. • Oakland, California • St. Louis
IN CANADA: Joliette Steel and Manitoba Steel Foundry Divisions
IN MEXICO: Amsco Mexicana, S. A.

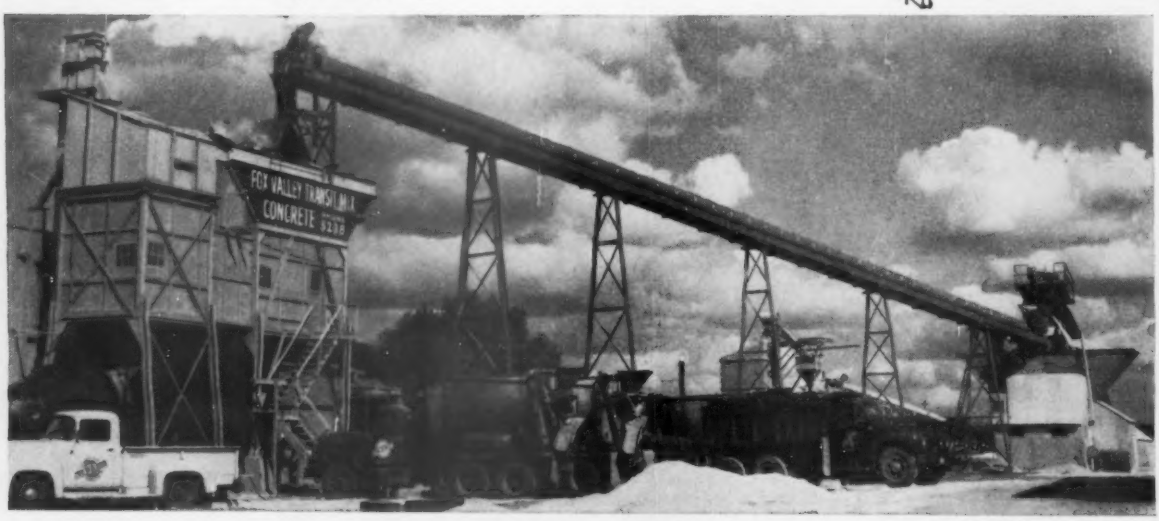
161



spaghetti is fine with chianti and meat balls...

BUT it went out of style in standard conveyors





STEPHENS-ADAMSON

SECTIONAL BELT CONVEYOR

FEATURING BENT PLATE DECKING

The exclusive STEPHENS-ADAMSON Bent Plate Decking feature provides a new concept in simplicity in conveyor erection. Four high-strength bolts fasten head assembly — eight bolts join intermediate sections — and six bolts connect tail assembly — for simplest and easiest installation ever. Bent Plate Decking affords protection for return run of belt.

The S-A Sectional Belt Conveyor combines quality conveyor components and features provided in no other pre-engineered conveyor in the low cost field.

Find out today why the S-A Pre-engineered Sectional Belt Conveyor featuring Bent Plate Decking makes spaghetti-like truss type conveyors obsolete.

WRITE FOR BULLETIN 458

S-A
ENGINEERED BULK HANDLING SYSTEMS
MATERIALS HANDLING PRODUCTS
SPEEDWALK® PASSENGER CONVEYORS
SEALMASTER® BALL BEARING UNITS
SPHERCO® BEARINGS & ROD ENDS

AVAILABLE IN 18", 20", 24", 30" and 36" WIDTH CONVEYORS—
DELIVERED FROM STOCK . . . COMPETITIVELY PRICED

STANDARD PRODUCTS DIVISION
STEPHENS-ADAMSON MFG. CO.
GENERAL OFFICE & MAIN PLANT, 20 RIDGEWAY AVE., AURORA, ILL.

PLANTS LOCATED IN: LOS ANGELES, CALIF. • CLARKSDALE, MISS.
BELLEVILLE, ONT. • MEXICO CITY, D.F.

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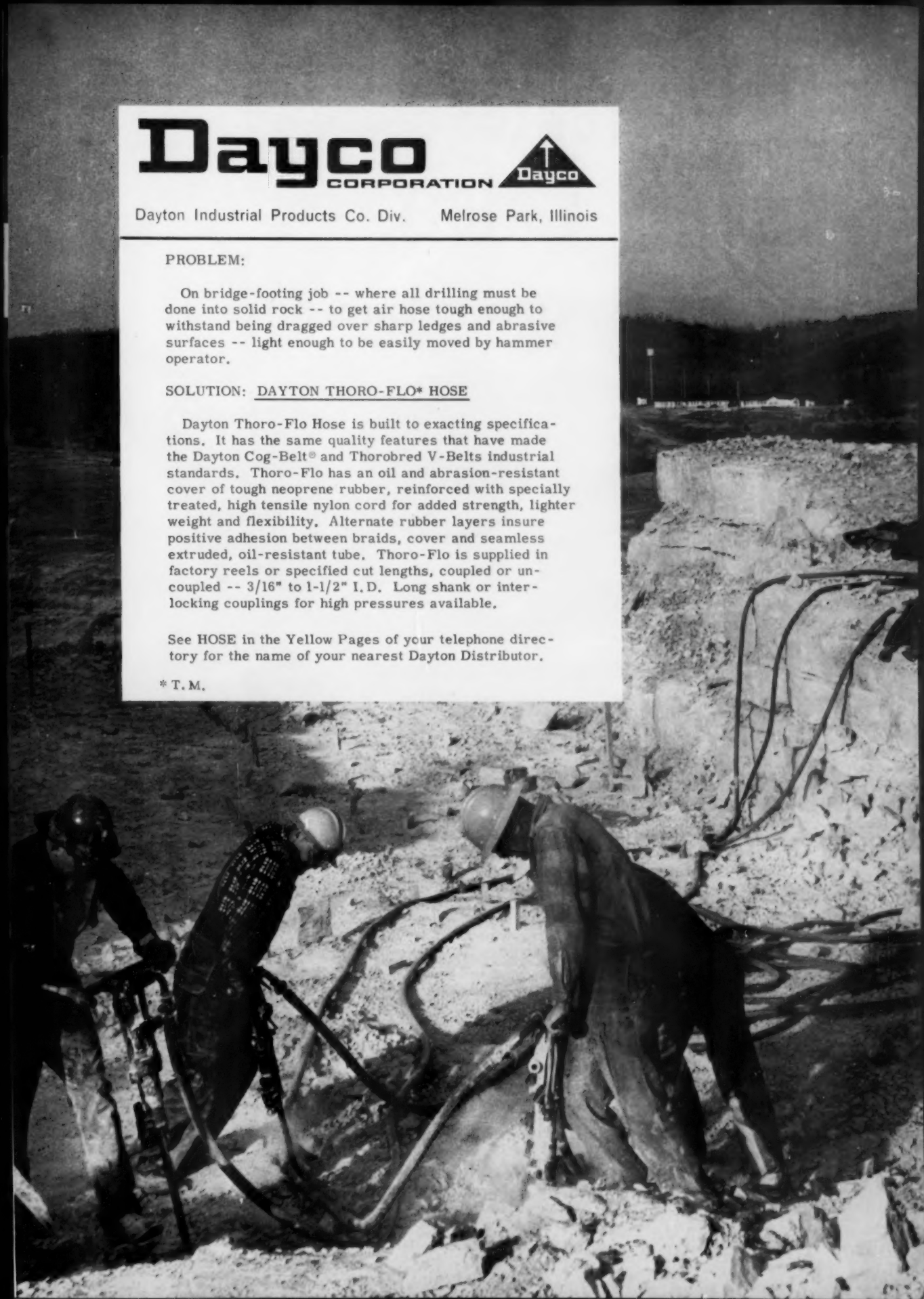
Enter 19 on card, page 177 →



Dayco CORPORATION

Dayton Industrial Products Co. Div. Melrose Park, Illinois

PROBLEM:

On bridge-footing job -- where all drilling must be done into solid rock -- to get air hose tough enough to withstand being dragged over sharp ledges and abrasive surfaces -- light enough to be easily moved by hammer operator.

SOLUTION: DAYTON THORO-FLO* HOSE

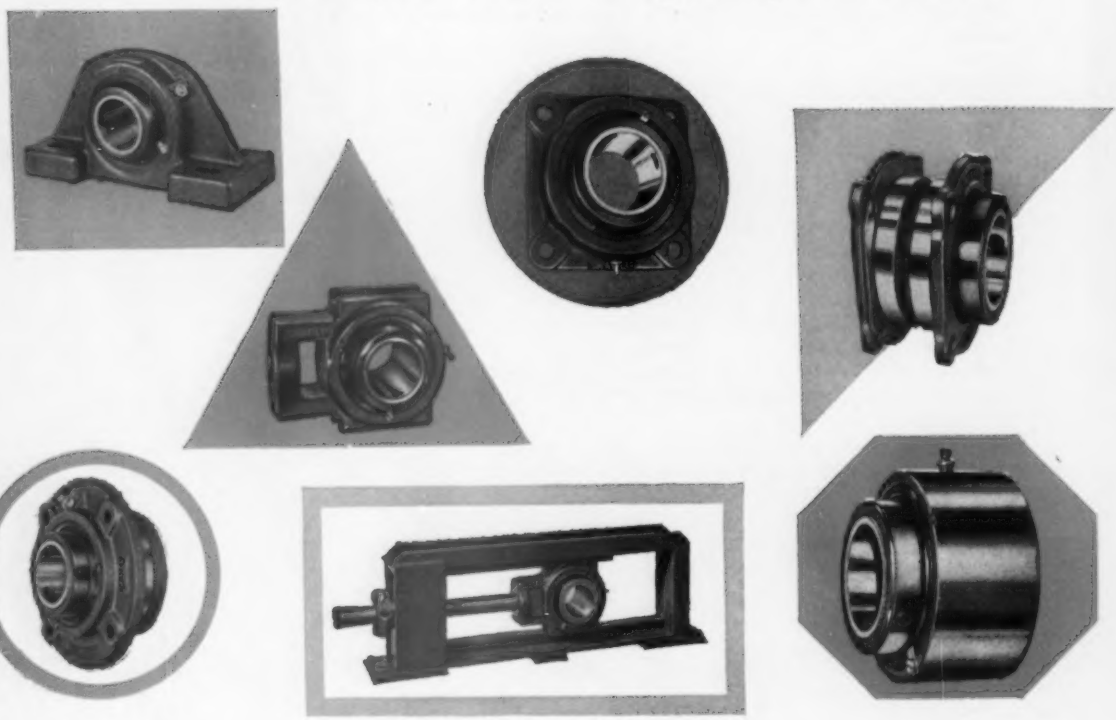
Dayton Thoro-Flo Hose is built to exacting specifications. It has the same quality features that have made the Dayton Cog-Belt® and Thorobred V-Belts industrial standards. Thoro-Flo has an oil and abrasion-resistant cover of tough neoprene rubber, reinforced with specially treated, high tensile nylon cord for added strength, lighter weight and flexibility. Alternate rubber layers insure positive adhesion between braids, cover and seamless extruded, oil-resistant tube. Thoro-Flo is supplied in factory reels or specified cut lengths, coupled or uncoupled -- 3/16" to 1-1/2" I.D. Long shank or interlocking couplings for high pressures available.

See HOSE in the Yellow Pages of your telephone directory for the name of your nearest Dayton Distributor.

* T.M.

greatest variety

lets you select the housing that's best



Why use costly specials? Why substitute? With Shafer-Rex you can select the one housing that's best for your specific requirements.

The Shafer-Rex line of mounted roller bearings is the most complete in the industry. You can select from a variety of housing styles—each available with normal-duty, heavy-duty and adapter bearings.

And, style for style, Shafer-Rex saves space. It fits into the tight spots, allowing you maximum freedom of design.

In addition, a Shafer-Rex Self-Aligning Bearing assures long life: eliminates additional wear and stress of misalignment; takes severe shock and loading safely; takes thrust loads without strain or binding.

Write CHAIN Belt Company, 4604 W. Greenfield Ave., Milwaukee 1, Wis. In Canada: Rex Chainbelt (Canada) Ltd., Toronto and Montreal.

SHAFER® REX® SELF-ALIGNING ROLLER BEARINGS

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BIG APPETITE FOR ROCK PRODUCTS

For screening ease and speed, nothing matches the efficiency of Hendrick Perforated Metal screens. Large, precision perforations provide extra capacity for extra profits, eliminate blinding and assure accurate sizing. These heavy-duty high-carbon or heat treated steel screens are designed for continuous, wear-resistant service. They are available in flat or corrugated plate and in a wide range of round, square and hexagonal openings to suit your specific requirements. Furnished with standard hook flanges for easy attachment to any vibrator. Call your local Hendrick representative (he's listed in your Classified Telephone Directory under Metals, Perforated)—or use the coupon below for further information.

HENDRICK Manufacturing Co.
Carbondale, Penna.

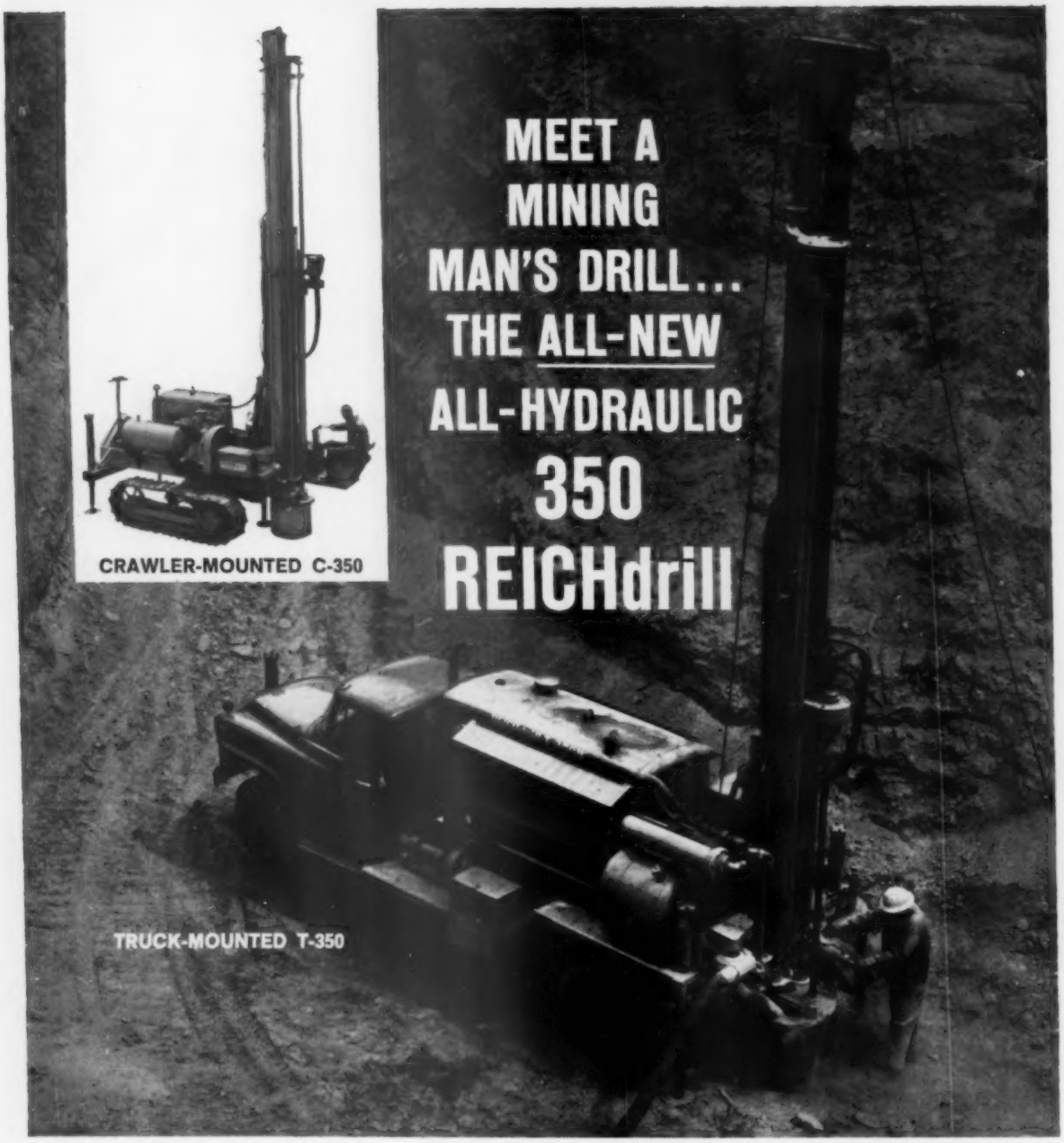
Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens
Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Open Steel
Flooring • Shur-Site Treads • Armorgrids • Hendrick Hydro Dehazers

HENDRICK Manufacturing Company
Carbondale, Penna.

Gentlemen: I want more information on Hendrick Perforated Metal screens.

☐ Please have representative call.
☐ Please send FREE literature on Perforated Metal Screens.

Name_____
Title_____
Company_____
Street_____
City_____ State_____



NOMINAL HOLE SIZE—1⅞" TO 5⅛" ● DOWN PRESSURE—10,000 LBS. ● ROTARY SPEED TO 540 RPM

Here's the ultimate in a mobile drilling rig for holes to 5⅝" ...the all-new 350 REICHdrill.

Job performance records under extreme drilling conditions have proved the cost-cutting advantages of its all-hydraulic features: Rotary Top-Drive; Precise Feed Pressure Control; Fast-acting Levelling Jacks.

The 350 moves in quickly...sets-up fast, breaks footage records on every shift. Handles 3-cone rotary bits, in-hole drills, diamond core bits, wire line tools, or drag bits.

C-350 Crawler-Mounted REICHdrill is unmatched for maneuverability and stability. Trams easily at almost 8 mph ...can climb a 25% grade...turn in its own length. Low center of gravity...wide tracks help it meet and beat any tough terrain.

T-350 W Truck-Mounted REICHdrill has all the time-saving, cost-cutting hydraulic features of the crawler-mounted unit. Offers complete mobility...saves schedule-killing time on moves between drilling sites.

Ask for SP-5001-2

REICHdrill
FRANKLIN (VENANGO COUNTY), PENNA.
Division: CHICAGO PNEUMATIC TOOL CO.

News of the Industry

First White Cement Plant West of Rockies Opened By Riverside Cement Co.

Opening of the newly completed $5,000,000 white cement plant of the Riverside Cement Company at Riverside, Calif., will be the first step in the firm's $20,000,000 improvement program.

After full-scale operation has been reached, a sum estimated at $15,000,000 will be spent on complete reconstruction and modernization of the older plant in which gray cement is manufactured.

A major difference in the equipment used to turn out white cement is that for the latter the mills are lined with porcelain, rather than steel. The new white cement facility will be the only plant of this kind west of the Rockies and the fifth one in the United States. Estimated annual output will be 94,000,000 lb. Availability of suitable raw material locally was the deciding factor in erecting the plant at Riverside.

"Nytralite" Added to Products Of New York Trap Rock Corp.

New York Trap Rock Corporation, a major producer of crushed stone, has entered the lightweight aggregate field. Spokesmen state that the New York metropolitan area will be served with a high-grade structural lightweight aggregate by the spring of 1962.

Construction of a $2,000,000 plant is planned at Ulster near Kingston, N. Y., where a subsidiary company will produce "Nytralite" at the rate of 500,000 cu. yd. per year. Paul M. Hedley, former vice-president of North American Cement Corporation, is president of the lightweight aggregate operation.

Preliminary tests indicate that the material to be produced at the new plant will rate high in the terms of strength, lightness, and uniformity. Shipments will be made *via* barge, rail, and truck. Trap Rock has a fleet of 230 barges in addition to a modern towing service supplied by another of its subsidiaries, the Cornell Steamboat Company.

New York Trap Rock maintains quarries at West Nyack, Haverstraw, Tomkins Cove, and Poughkeepsie, N. Y., and a shipyard at Newburgh, N. Y.,

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With May 1, 1962, as the target date for completion, construction of Ideal Cement Company's new installations in North Carolina will begin in the immediate future. Contracts have been let for the first stages of the program. Plans call for a marine transfer station at Wilmington, storage and packing facilities at Castle Hayne, and a terminal at Fayetteville.

$5 Million Asbestos Plant Being Erected in California For Jefferson-Lake Sulphur

Construction of a $5,000,000 asbestos plant is scheduled to begin this summer at a site near Copperopolis, Calif., for Jefferson-Lake Sulphur Company of Houston, Tex. Completion of the plant and start of production are scheduled for the first part of 1962.

Jefferson-Lake acquired the 480-acre site from American Asbestos Company of New York for $4,620,000. The entire undertaking thus represents an investment of approximately $10 million for this concern.

It was indicated that 15,000,000 tons of commercial asbestos ore have been proved in the Copperopolis holdings. The new plant will have a capacity of 2,000 tons per day.

Coming Events

June 11-15, 1961—New York City. 54th annual Air Pollution Control Association meeting. Hotel Commodore.

June 12-13, 1961 — Chicago. Mid year meetings of divisional boards and committees, National Limestone Institute, Inc. Sheraton-Blackstone Hotel.

June 25-30, 1961—Atlantic City. 64th annual meeting, American Society for Testing Materials. Chalfonte-Haddon Hall.

July 13-14, 1961—White Sulphur Springs, W. Va. Midyear meeting, National Crushed Stone Association board of directors. The Greenbrier.

July 20-21, 1961—Allentown, Pa. Midyear meeting, The Expanded Clay and Shale Association. Americus Hotel.

July 23-26, 1961 — French Lick, Ind. Midyear meeting, National Bituminous Concrete Association. French Lick-Sheraton Hotel.

August 10-12, 1961 — Chicago. National Sand and Gravel Association Controllers' Conference. The Edgewater Beach Hotel.

August 20-24, 1961—White Sulphur Springs, W. Va. Semi-annual meeting, National Sand and Gravel Association board of directors. The Greenbrier.

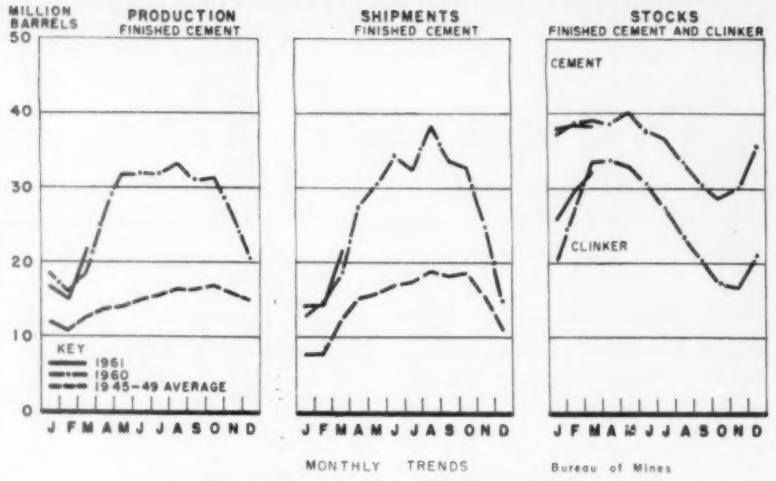
March New Construction Up By 11 Percent From April Figures

The value of new construction put in place in April, 1961, amounted to $4.3 billion, according to preliminary estimates of the U. S. Department of Commerce. This amount was 11 percent more than in March (compared to a normal seasonal increase of 9 percent between the two months), and 3 percent above the level in April, 1960.

Cumulative value for new construction expenditures in the first four months of 1961 was estimated at $15.6 billion, compared to $15.5 billion in the same period last year. While total private construction declined 4 percent to $11.1 billion, and private residential slipped 10 percent to $5.8 billion, total public construction increased 15 percent to $4.6 billion.

ITEMS: Private construction, estimated at $3.0 billion, was 9 percent greater than in March, and about the same as in April, 1960. Residential was estimated at $1.6 billion—15 percent more than in March, but 5 percent under April, 1960.

ITEM: Public construction, estimated at $1.1 billion, increased by slightly more than the normal seasonal change from March. It was up 17 percent (the usual increase is 16 percent), and was also 12 percent above April, 1960.



— March, 1961, Finished Portland Cement —

SUMMARY—Production of finished portland cement in March, 1961, as reported to the U. S. Bureau of Mines, totaled 21,851,000 barrels—an increase of 19 percent compared with March, 1960. Mill shipments totaled 21,884,000 barrels—an increase of 24 percent compared with March, 1960. Stocks of 38,234,000 barrels of finished portland cement were 2 percent less than those on hand March 31, 1960. Clinker production totaled 24,386,000—a decrease of 1 percent compared with March, 1960.

►PRODUCTION—One hundred and fifty nine plants in 39 states and Puerto Rico reported a production of 21,851,000 barrels in March, 1961.

Production of clinker totaled 24,386,000 barrels, compared with 24,520,000 barrels in March, 1960.

High-early-strength portland cement totaled 1,103,000 barrels—a decrease of 12 percent from the 1,245,000 barrels produced in March, 1960.

Prepared masonry cement production of 1,462,000 barrels increased 22 percent over the March, 1960, figure. Masonry cements are reported in 280-lb. barrels.

►SHIPMENTS—Mill shipments of finished portland cement from 175 plants totaled 21,884,000 barrels, compared with 17,681,000 barrels in March, 1960.

Shipments were higher in all but five districts. The greatest increases were in the Minnesota-South Dakota-Nebraska, Kansas, and Michigan districts.

Shipments of high-early-strength totaled 1,229,000 barrels—an increase of 22 percent over the 1,005,000 barrels shipped in March, 1960.

Shipments of prepared masonry cement totaled 1,560,000 barrels—an increase of 39 percent over the 1,120,000 shipped in March, 1960. Prepared masonry cements are shown in 280-lb. barrels, although they are sold in barrels of varying weights.

►STOCKS—Mill stocks of 38,234,000 barrels of finished portland cement were on hand March 31, 1961—a decrease of 2 percent from the 39,165,000 on hand March 31, 1960. Stocks of clinker on hand March 31, 1961, totaled 32,250,000 barrels—a decrease of 4 percent compared with the 33,474,000 barrels on hand March 31, 1960.

►FIRST THREE MONTHS OF 1961—For the January-March period, the production volume of finished cement amounted to 53,633,000 bbl., compared with 53,171,000 bbl. in the 1960 three-month period. Total shipments for the first three months of 1961 are reported at 50,409,000 bbl.; in the same period of 1961 total shipments were 45,023,000 bbl. (Shipment figures no not include finished cement used in the manufacture of prepared masonry cement, as follows: March, 1960—131,000 bbl.; January-March, 1960—396,000 bbl.; March, 1961—264,000 bbl.; January-March, 1961—488,000 bbl. ●

H. N. Huntzicker Elected A-M Director—Delcher V-P

Harry N. Huntzicker has been elected a director of American-Marietta Company. He has been executive vice-president since April, 1956. Prior to joining American-Marietta, he was vice-president in charge of research and development with the United States Gypsum Company.

At the same time Edwin G. Delcher was elected a vice-president. He will continue as treasurer, a post he has held since 1958.

Plans have been announced for the construction of five dust collection units for the Riverside Cement Company's Oro Grande plant at a cost of about $1,000,000.

Hetherington Resigns Post At Hawkeye-Marquette Co.

G. F. Hetherington, president and sales manager of Hawkeye-Marquette Cement Company, announced his retirement after 40 years with the Iowa company and its parent organization, Marquette Cement Manufacturing Company. His duties as sales chief have been assumed by M. C. Miller, vice-president.

Mr. Hetherington joined the Marquette organization as a salesman in 1919. In 1940, when Marquette purchased the Hawkeye Portland Cement Company, he was elected vice-president and sales manager, and later (in 1946) president of this subsidiary.

Employees at Ideal Cement Company's Portland (Colo.) plant recently celebrated the completion of the operation's seventh accident-free year. This is the best safety score among the 17 Ideal plants.

Enter 25 on card, page 177 →

EAGLE PORTABLE SAND SECTIONS

go places and do things*

*Such as turning out a volume of specification concrete sand or two different gradations of sand at the same time. The Eagle Portable can do it because it has two Single Screw Fine Material Washer-Classifier-Dehydrators below a Water Scalping-Classifying Tank with automatic bleeder valves, multi-cell collecting-Blending flume and metering "splitter" gates, just like Eagle's stationary sand washing-classifying sections. Centralized push-button control.

And the Eagle Portable goes places—quickly made ready for travel—just hitch on a truck tractor—quickly set up at the operations site. Just wheel it in next to the screen. Now it's possible to make quick moves from one location to another in the same pit or locate in available pits near construction projects thus eliminating long material hauls. You can compete better—go where the business is with an Eagle Portable.

Eagle developed the Water Scalping-Classifying Tank—always ahead in engineering and service Eagle went a step farther and put it on wheels. Typical Eagle Portables of four different producers, in the States and Canada, are shown—a few of the many in use. Send for literature on Eagle Portable Sand Sections!

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C. A. Barinowski of Vulcan Resigns from V-P Post After 44-Year Service

Clarence A. Barinowski, commercial vice-president of Vulcan Materials Company, retired from this post on April 30. Mr. Barinowski's outstanding ability has made a most important contribution to the growth of this company from a relatively modest beginning to its present position as one of the major suppliers of construction materials. In doing so, Mr. Barinowski contributed greatly to the growth and prosperity of the Birmingham area during his 44 years of service with the company.

Mr. Barinowski's retirement climaxes a career that began when he joined the Birmingham Slag Company in 1917 as secretary to C. Eugene Ireland. He will continue to serve Vulcan Materials Company as a consultant, working primarily with its Alabama and Georgia aggregates divisions on special projects. He will also continue as a director of the corporation.

In announcing the retirement of Mr. Barinowski, Charles W. Ireland, Vulcan chairman, paid this tribute to Mr. Barinowski: "The contributions that Mr. Barinowski has made . . . both to his company and to his industry . . . are universally recognized. He is known and highly respected throughout the nation, as is reflected by his election to the highest offices in industry organizations."

Mr. Barinowski's pioneering work in marketing blast-furnace slag—a by-product of Birmingham's steel industry—resulted in the extensive use of slag aggregate as a basic construction material. He was instrumental in promoting its use by railroads throughout the Southeast as track ballast, and by contractors for highways and other types of construction.

Through Mr. Barinowski's efforts, a partnership of Birmingham Slag and Lambert Brothers, Inc., became Atlanta's Stockbridge Stone Company, now a Vulcan division. (Lambert Brothers, a Tennessee aggregate producer, has also become a Vulcan division.)

Mr. Barinowski is now a director of the National Crushed Stone Association, the National Sand and Gravel Association, and the National Slag Association. He served the latter for three terms as president.

C. A. Barinowski

McLanahan & Stone Corp. Gets Official New Name

As of March 17, the corporate name of the McLanahan and Stone Corporation, Hollidaysburg, Pa., was changed to McLanahan Corporation. It was stated that the change was made to eliminate the common impression that the firm is a supplier of crushed stone, gravel, and/or similar materials.

The 126-year-old company manufactures equipment for pit, mine, and quarry operations. It is a direct descendant of a concern founded in Hollidaysburg in 1835. The McLanahan family has been associated with the firm since 1848.

The New Paris (Ind.) Stone and Lime Company in Bedford County is a new industry operated by Sherwood G. Mowry and Joseph Hrebar. Products will include limestone and calcined lime and limestone for commercial, and agricultural uses.

According to Boyce Martin, president of the Louisville Cement Company, the Logansport, Ind., plant will be completed by October, 1962, and full-scale operation will be attained during 1963.

James P. Giles

Giles Named President Of N. American Cement, Succeeding W. C. Russell

James P. Giles has been elected president and chief executive officer of American Cement Corporation, succeeding Walter C. Russell.

Mr. Russell, who has served American Cement and its predecessor companies since 1933, will continue to serve as vice-chairman of the board of directors, a member of the executive committee, and also as a consultant.

Mr. Giles, who became executive vice-president last year, began his career in the cement industry in 1951, when he joined Hercules Cement Company as assistant to the president. He served in a number of executive capacities with Hercules, finally becoming president in 1958. In that year, Hercules, Peerless Cement, and Riverside Cement merged to form American Cement Corporation. Mr. Giles was named executive vice-president of American Cement in May, 1960.

Raymond Simon, associate research professor, Utica (N.Y.) College of Syracuse University, has been awarded a research fellowship by the Calcium Chloride Institute. This fellowship is to be used for pilot study of highway officials' opinions on road construction and maintenance in Iowa and Pennsylvania.

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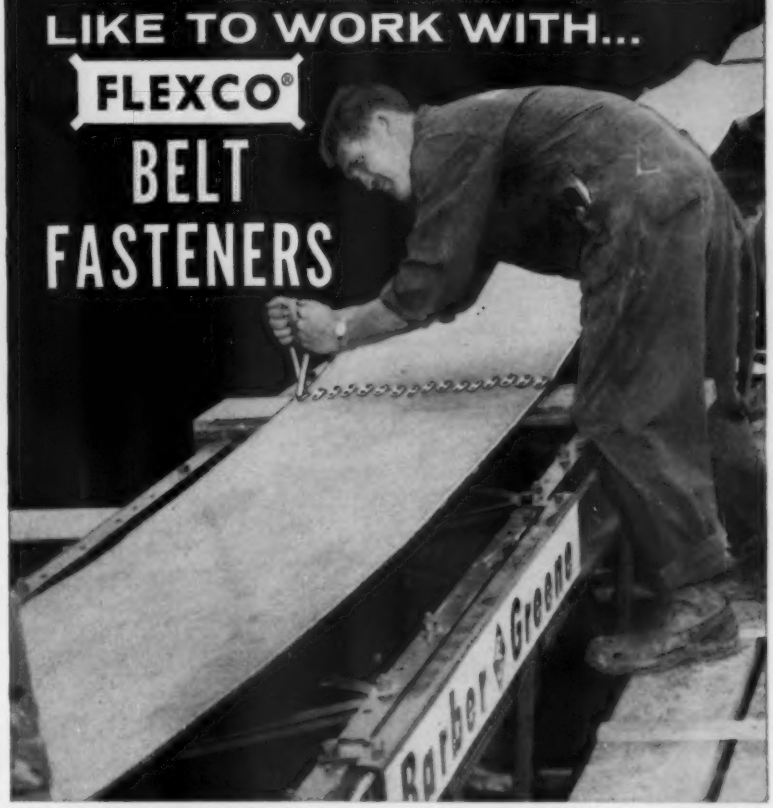
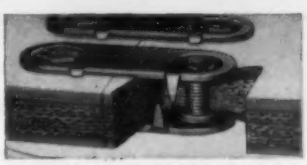
BELT FASTENERS



Lowell Lynde, Service Engr., Barber-Greene Co. completing the installation of a FLEXCO splice.



Cutaway of a FLEXCO application showing the compression plates, teeth and precision-made bolts and nuts.

He says, "I've spliced most of the belts our Chicago office has sold throughout Illinois and northern Indiana. FLEXCO fasteners have been used on all of them without any trouble. They are easy to install and hold up well regardless of the material conveyed."

PROTECT YOUR INVESTMENT IN CONVEYOR BELTS WITH FLEXCO . . . the quality fastener for all heavy-duty conveyor belt applications: COAL & METALS, SAND & GRAVEL, CRUSHED ROCK, CONSTRUCTION EQUIPMENT, etc.

Available in Steel, Monel, Stainless, Everdur. Also Promal top plates.

FLEXCO "25-PAK"

"25-PAK" contains enough fasteners to join common belt widths.

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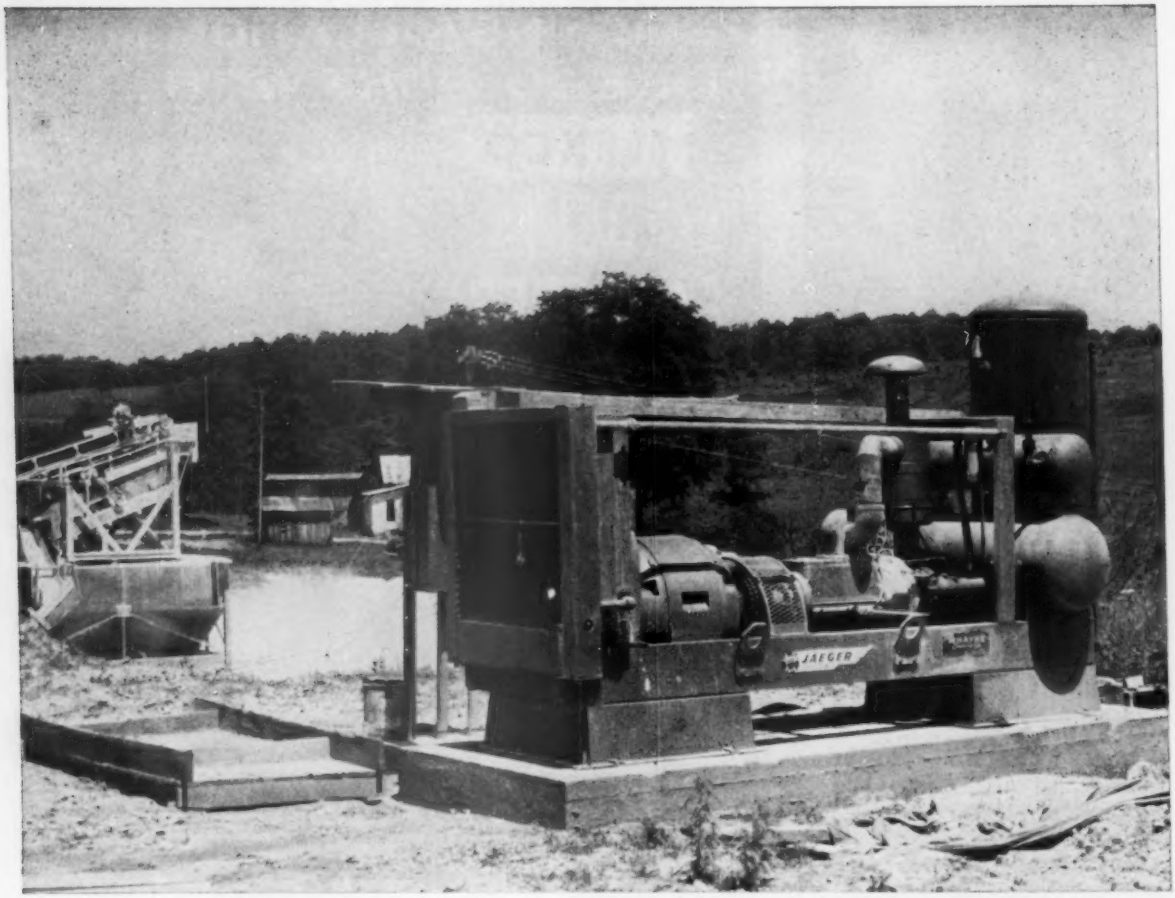

This motor-driven compressor is *paying for itself* with what it saves in maintenance costs. Photo taken before unit was housed.

Jaeger Announces an Advanced Electric Rotary Compressor for Quarries

- **Electric drive reduces power unit maintenance.**
- **Rotary design reduces compressor maintenance.**
- **Vibration freedom eliminates heavy foundations.**
- **Oil-and-air cooling eliminates water lines.**
- **High efficiency produces 625 cfm at 1770 rpm, ample for biggest drill. Smaller units comparably efficient.**

Portable mountings with housing if desired.

The 2-stage sliding-vane type rotary compressor runs as smoothly as its electric motor. Air delivery is continuous, without intermittency or pulsation. There are no valves or pistons. It weighs 30% less than reciprocating compressors and delivers 100° cooler air.

Available with or without motor, in 30, 60, 100, 150 hp models of 130, 260, 380 and 625 cfm air capacity, 100 psi pressure. For specifications and prices, call your Jaeger distributor or write for additional information.

JAEGER DESIGN PROVED IN THOUSANDS OF COMPRESSORS IN THE FIELD

In continuous all-weather operation, by many large users, Jaeger Roto Air Plus compressors are notable for efficiency in producing air with low power consumption and minimum cost of maintenance. Because wear on rotor vanes is automatically compensated for by centrifugal force, efficiency never varies. Air-cooled oil removes the heat of compression and lubricates so efficiently that 8000 hours without a single vane replacement is not unusual.

THE JAEGER MACHINE COMPANY

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Worldwide sales and service through Jaeger International Corp., Apartado 137, Panama, R. P.

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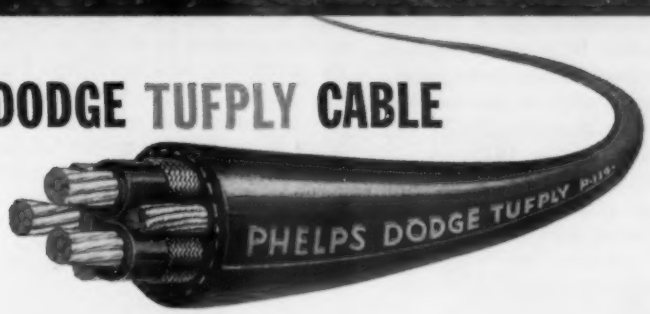
PHELPS DODGE TUFPLY CABLE



• Made of highest quality copper from Phelps Dodge's own mines. • Combines years of Phelps Dodge mining "know-how" with many years of cable manufacturing experience to give you the finest quality portable cable you can specify. • Assures utmost protection against damage from mechanical and electrical hazards in both above and below ground mining operations. • Listed by the U.S. Bureau of Mines, and approved by the Department of Mines, Commonwealth of Pennsylvania, P-114-BM. • *First for Lasting Quality—from Mine to Market!*

PHELPS DODGE COPPER PRODUCTS
CORPORATION 300 Park Avenue, New York 22, N.Y.

Fred L. Doolittle (left), newly elected president and chief executive officer of Penn-Dixie Cement Corporation, who succeeds D. W. Druckenmiller (right), named to the post of chairman. (See story below.)

Doolittle Elected President Of Penn-Dixie-Cement— Druckenmiller Chairman

Fred L. Doolittle has been elected president and chief executive officer of the Penn-Dixie Cement Corporation, succeeding B. W. Druckenmiller, who has been elevated to the post of chairman.

Mr. Doolittle, a native of Massachusetts, joined Penn-Dixie's Boston sales office in 1929. He was made assistant sales manager in 1941 at the company's New York headquarters, general sales manager in 1945, and executive vice-president and director in 1956.

Mr. Druckenmiller, who has been president since 1945, guided the company through its period of postwar expansion. He is also a director of the Portland Cement Association, and has been active in the nation's cement industry since 1913. He joined Penn-Dixie in 1929.

Penn-Dixie operates 10 cement manufacturing plants in the Northeast, Midwest, and South. Since 1945 the capacity has been doubled. Present capacity is 18,500,000 bbl. annually.

Ideal's Devil's Slide Plant Built in 1904 Being Dismantled

At Devil's Slide, Utah, a historic landmark is disappearing with the dismantling of Ideal Cement Company's original plant, built there in 1904. This installation has not been used since 1951, although certain buildings have been utilized for storage purposes since a fire destroyed the store room in 1956. The present plant was built in 1947-48.

Records show that the first shipment of cement left the original plant at Devil's Slide in 1907. At that time the capacity of the plant was approximately 1,500 bbl. per day, or less than 600,000 bbl. annually. Present annual capacity is 1,850,000 bbl.

Henry J. Kaiser Jr. Dies At 44 After Long Illness

Henry J. Kaiser Jr., son of the founder-chairman of Permanente Cement Company and Kaiser Gypsum Company, Inc., died on May 2 in Oakland, Calif., after an extended illness. He was 44 years old.

Mr. Kaiser began his business career as a construction project superintendent during the building of Permanente's cement plant near San Jose, Calif. During World War II he was engaged in duties involving the production of Liberty and Victory ships, U. S. Navy Corsair fighter planes, and artillery shells. While he was serving as head of the Kaiser-operated shell plants at Denver and Fontana, he was stricken with multiple sclerosis.

$20,000,000 Tulsa Plant Of Dewey Cement Co. In Full-Scale Operation

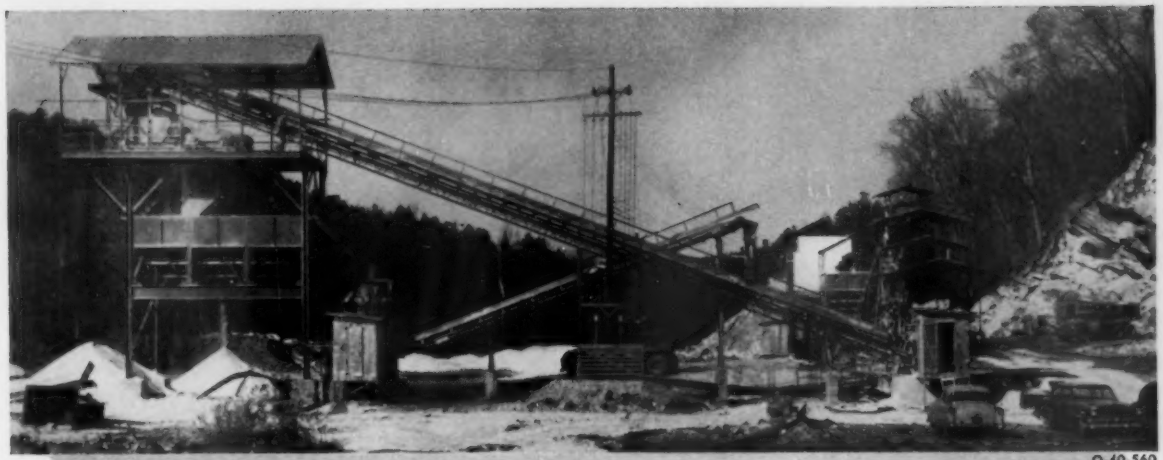
At Tulsa, Okla., a trainload of cement was shipped out of the new Dewey Portland Cement Company plant on April 19, marking the start of full-scale operation at the newly completed $20,000,000 facility. Each of the cars carried 400 bbl. of bulk cement.

Operations at this modern push-button installation will be maintained on a 24-hour schedule. Capacity is reportedly 1,250,000 bbl. annually. Both limestone and shale used in manufacturing the cement are mined at the plant site. Limestone reserves are sufficient for the next 200 years.

The new management of Atlas Light Aggregate Ltd., St. Boniface, Manitoba, and Light Aggregate (Sask.) Ltd., Regina, Sask., has established headquarters at Winnipeg, Man., with T. Burke-Ganney as manager of both operations. The concerns were sold to the present owners last year by Dr. Ray Lemley.

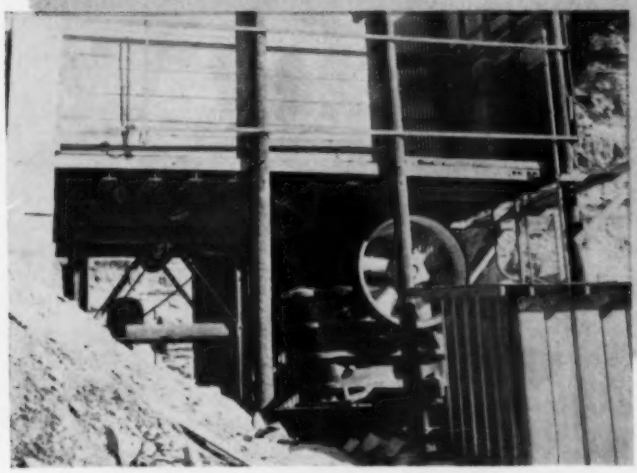
The place and dates for the annual meeting of the National Slag Association were announced recently after a meeting of the association's executive committee. Sessions will be held at the Pocono Manor Inn, Pocono Manor, Pa., on Oct. 4 and 5, 1961. An extra day will be held in reserve for an inspection tour of the new Bethlehem Steel Company research Center.

● With Eugene Sengelman (right), newly appointed plant manager of The Idealite Company's new Rocky Flats plant, are Martin Mechling, maintenance supervisor; H. L. Grigg (standing), chief clerk; and Linus Freeman, general foreman. The new installation, six miles south of Boulder, Colo., is expected to be completed soon. Idealite is an expanded-shale aggregate.



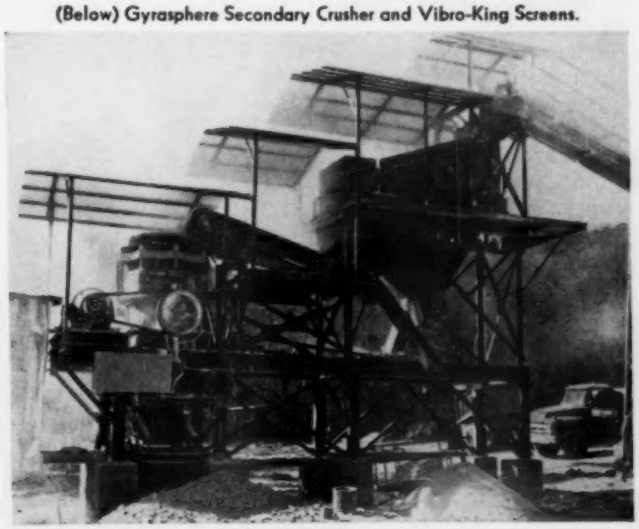
Q-40-560

Georgia Marble Co. crushing plant



(Above) Telsmith Jaw Crusher and Apron Feeder.

(Below) Gyrasphere Secondary Crusher and Vibro-King Screens.



TELSMITH *designed*

to produce road rock and roofing chips

Making 125 tons per hour of 1½" plus ¼", and minus ¼" aggregate for road rock... or crushing everything down to minus ⅜" plus ¼", minus ¼" plus ⅛", and minus ⅛" when producing roofing chips, at 75 tons per hour. That's what Georgia Marble Company's Whiteside, Ga. crushing-screening plant was Telsmith-designed to do. Does it smoothly and steadily day-in-day-out. Tailor-made for today's conditions and competition, Telsmith plants pay off in capacity, product flexibility and operating economy. Send for descriptive bulletins.

TELSMITH Equipment in this plant—

36" x 8' Heavy Duty Apron Feeder • 25 x 36 Roller Bearing Jaw Crusher • 4' x 10' double deck Vibro-King Screen • 36-S Gyrasphere Secondary Crusher • 5' x 16' triple deck Vibro-King Screen • Three 15" x 15" Duplex Bin Gates • Five Telsmith-Barber-Greene Conveyors: 18", 24", 36", total length, 312'.

SMITH ENGINEERING WORKS

504 E. CAPITOL DRIVE **MILWAUKEE 1, WISCONSIN**

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● This Caterpillar D8H tractor with a three-tooth ripper and hydraulic dozer has solved the problem posed by random flint deposits in limestone at the quarry of Lansing Rock Co. Inc., near Brooksville, Fla. The flint rock, occurring in pockets and layers at various depths throughout the pit, precluded mining by the conventional drill and shoot method. Digging with a shovel broke the limestone into pieces so large that they slowed production of the primary crusher.

Superintendent Bill Buting solved the problem by assigning two Caterpillar D8 Tractors to the job of ripping and dozing over the bank to the shovel for loading. The Series H Tractor rips the material to a depth of approximately 24 in., breaking it into smaller pieces which are more easily handled by the primary crusher. Larger boulders of flint are removed by the hydraulic dozer. The tractor is also used to strip overburden, to clean up around the Bucyrus 54-B shovel which loads the trucks, and to maintain haul roads.

March Building Awards Increase by 4 Percent, Resume Upward Trend

During March, notable gains in residential building and heavy engineering contracts awarded sparked a 4 percent rise in total future construction contracts, according to F. W. Dodge Corporation. Contracts totaled $3,165,816,000—well above February's $2.2 billion, resuming a trend of monthly year-to-year increases which was interrupted by a decline in February.

On a seasonally adjusted basis, the Dodge Index of construction contracts rose 10 percent above the relatively depressed February level, reading 262 in March (1947-49=100), compared with 239 in February and 273 in January.

In evaluation, Dodge economists said, "The March contracts provide further evidence that the business recession has bottomed out and that activity is now on the increase." A particularly encouraging note was found in the 5 percent gain over a year ago in the number of dwelling units covered by the residential contracts. It was the first such gain in 19 months, with the exception of last November. Accompanying this fact was the emphasis on the point that the gain occurred entirely in apartment buildings, with single family homes continuing to decline.

A summary of the latest figures follows:

	March, 1961	March, 1960	% Change
Nonresidential bldg.	$1,027,238,000	$1,067,460,000	— 4%
Residential bldg.	1,370,984,000	1,293,607,000	+ 6%
Heavy engineering	767,594,000	685,278,000	+12%
Total construction	$3,165,816,000	$3,046,345,000	+ 4%
	3 Mo. 1961	3 Mo. 1960	% Change
Nonresidential bldg.	$2,639,443,000	$2,557,957,000	+ 3%
Residential bldg.	3,208,070,000	3,199,669,000	*
Heavy engineering	2,023,547,000	1,700,065,000	+19%
Total construction	$7,871,060,000	$7,457,691,000	+ 6%

*up less than ½%

Marling J. Ankeny Continues As Director of Mines Bureau

Stewart L. Udall, Secretary of the Interior, announced recently that Marling J. Ankeny, an employee of the Department of the Interior for 28 years, will continue as director of the department's Bureau of Mines. Mr. Ankeny was appointed director in 1956.

Mr. Ankeny served as assistant director and director of safety and welfare for the National Mining Company before joining the Federal Government in 1928. He became chief of the Mines Bureau's coal mine inspection branch in 1948. He left the bureau in 1952 to accept a position as safety director of the Bituminous Coal Operators' Association, where he served until he was appointed director of the bureau in 1956.

S. G. Thyrre Succeeds Thune As F. L. Smidth President

Erik Thune, chairman and president of National Portland Cement Company, has announced, in his capacity as chairman of F. L. Smidth & Company, New York, that Sven G. Thyrre has been

S. G. Thyrre

elected his successor as president of F. L. Smidth & Co.

Mr. Thyrre will continue to serve as executive vice-president of National Portland Cement Company.

Employees of the Ruberoid Company's gypsum plant at Wheatland, N. Y., were recently awarded a plaque for a perfect safety record during 1960.

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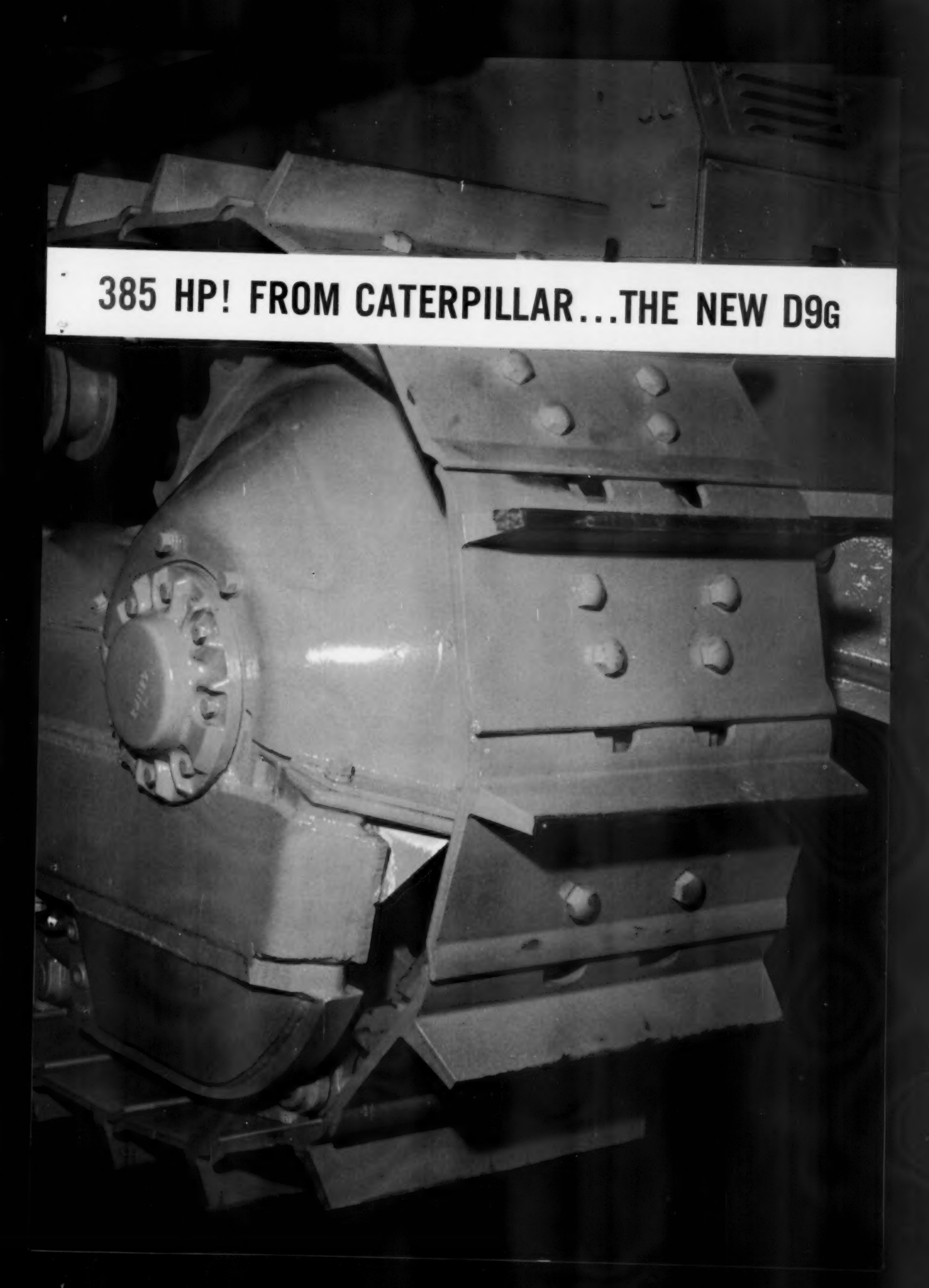

385 HP! FROM CATERPILLAR...THE NEW D9G

NEW D9G: 385 HP, 64,800 LB., POWER SHIFT,

For high-volume dozing, pushloading or ripping, the new D9G has what it takes . . . at minimum cost per yard!

The engine in the new D9 delivers 385 flywheel horsepower. That's *100 more horsepower* than the first D9 introduced five years ago!

Weight: 64,800 lb.—14% more than the first D9!

Torque divider power shift transmission . . . massive heavy-duty undercarriage . . . and power train with new, built-in ruggedness for long life.

What else is new? Matching the D9G, to make best use of its power, is a full line of attachments. Cable controls, hydraulic controls, pushing equipment, dozers, rippers and others—all designed to help this new tractor really put out on the toughest big jobs.

CAT D353 ENGINE AND MATCHED POWER TRAIN

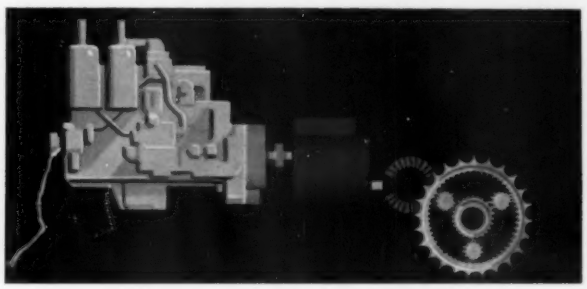
Engine: This engine, rated at 385 HP (flywheel) at 1330 RPM, has been proven over thousands of hours on the roughest jobs. Cat-built, its 6.25″ x 8″ 6-cylinder design now incorporates these new features:

• **Controlled Turbocharging**—This system, found only in the D9G among crawler tractors, automatically forces more air into the cylinders during lug. Result: increased maximum torque, fast engine response over a wide range of operation.

• **Aftercooler**—Air leaving the turbocharger passes through a water-cooled heat exchanger. Cooled air has greater density. Thus, more air can be packed into the cylinders, giving greater power output and efficiency.

• **PLUS**—Shroud-mounted fan with torque limiting clutch provides maximum cooling during lug and reduces fan-absorbed HP by 30%. Exclusive Caterpillar fuel injection system allows use of low-cost fuel. Also, twin dry-type air cleaners . . . oil-jet-cooled pistons . . . "Hi-Electro" hardened cylinder liners and crankshaft journals.

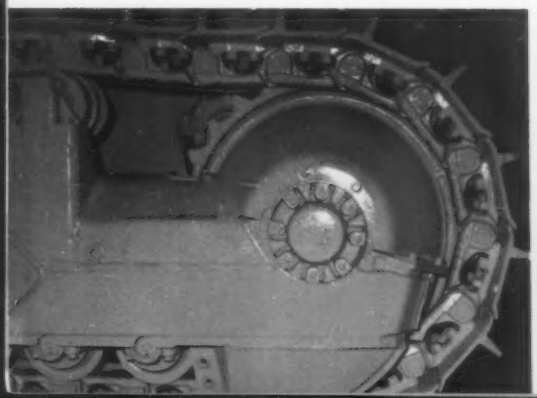
New Power Train: Major advances in the D9G's new power train include *new oil-cooled steering clutches and brakes, new planetary final drives*, and a time and cost saving *common lube system*.

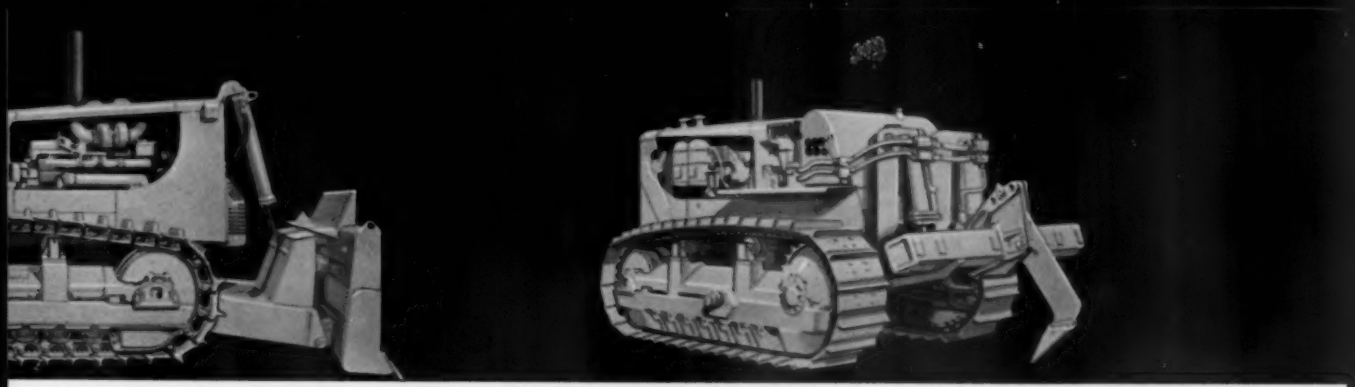


The new steering clutches, spring engaged and hydraulically released, need no adjustments. The longer service life of this type of clutch, as well as that of oil-cooled brakes, has been proven by millions of hours' use on D8H Tractors.

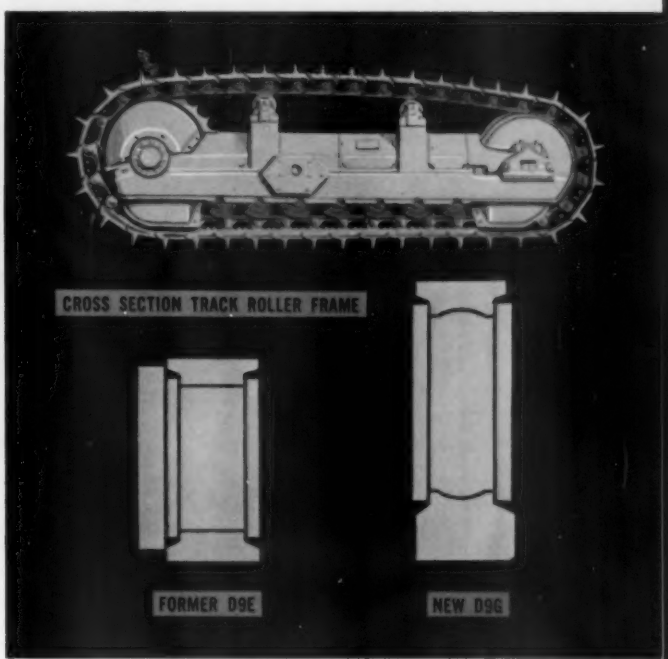
The new planetary final drives increase gear reduction ratios from 8.8:1 to 18:1, materially reducing torque load on all other power train components. A common system cools and lubricates torque divider, transmission, bevel gear, steering clutches and brakes. This means one service point . . . one type of oil. Final drives have their own pressure lube systems complete with pump, filter and disposable element.

Entire power train has unitized construction for fast, individual removal of components.





HIGH-PRODUCTION DOZER, PUSHER, RIPPER



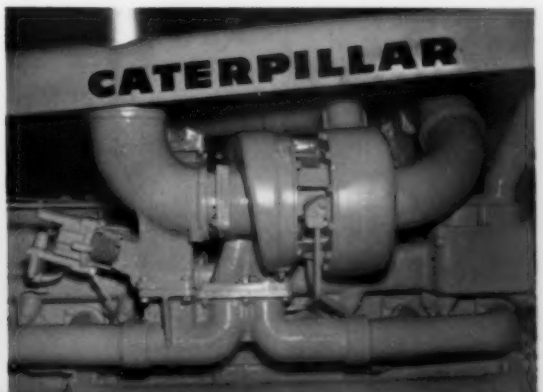
PROVEN TORQUE DIVIDER POWER SHIFT:

Standard equipment on the D9G, this exclusive Caterpillar design combines the efficiency and "snap" of direct drive with the load-matching and anti-stall characteristics of a torque converter.

A single lever gives the operator finger-tip control of his machine. It adds up to fast cycle times, less operator fatigue with greater efficiency. You get more out of the machine *all day*.

MASSIVE HEAVY-DUTY UNDERCARRIAGE:

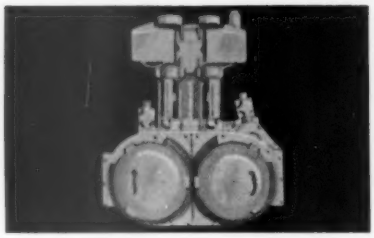
Immense strength and rigidity have been built into the D9G undercarriage to make it more than equal to the roughest ripping job. Box section frame is wider and deeper than previous models. Hydraulic track adjusters are standard. Lifetime lubricated rollers with special alloy deep hardened rims assure long life . . . and they require no servicing until rebuilt. These features give the D9G the finest big tractor undercarriage ever built.



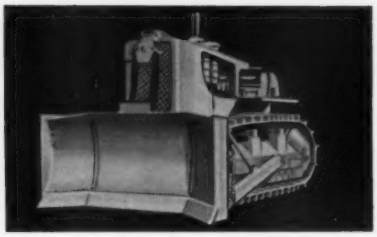
The NEW 385 HP D9G—with high-production attachments

The D9G is big . . . and, it becomes versatile, too, with the many matching attachments your Caterpillar Dealer offers. Cable controls, hydraulic controls, rippers, dozers, pushing equipment, scrapers and others help make the D9G the most productive big tractor available.

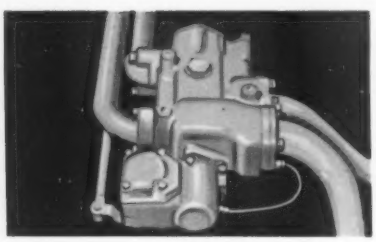
To prove the D9G's productive capabilities on your job, talk to your Caterpillar Dealer.



New cable controls have larger clutch, brake and drum capacities and are hydraulically boosted. Available in front or rear single drum for dozer application. Rear single drum may be converted to double drum at any time. You buy what you need.

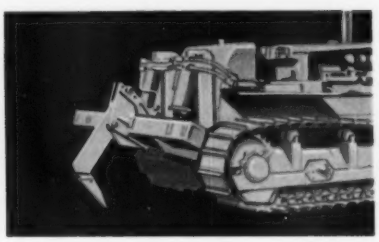


No. 9U can increase dozing production as much as 50%. Also available are No. 9A and No. 9S. Tilt cylinder can be used with U or straight blade. Choice of hydraulic or cable control for all blades. Hydraulic dozers have "quick-drop" valves.



New hydraulic controls available in nine arrangements to meet every application need.

No. 9C dozer combines dozing and cushioned pushing functions into one attachment. As a pusher, it allows 3 MPH cushioned contact. Rear-mounted cushion push block also available for tandem pushing.



No. 9 ripper—5-position clevis, selection of shanks and tips, quick-change features adapt No. 9 to a variety of materials and conditions . . . results in considerable savings over drilling and blasting.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U. S. A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Consol. Rock Products Names Q. Best President—Mitchell Board Chairman

Quentin W. Best was elected president of Consolidated Rock Products Company, Los Angeles, at a recent directors' meeting. He succeeds Robert Mitchell, who was named chairman of the board.

Mr. Best began his career when he joined Consolidated at its inception in 1929. He served initially as a salesman and subsequently advanced in the organization, occupying the following posts—assistant sales manager, general sales manager, vice-president and director, and executive vice-president.

The national trade associations have been among Mr. Best's major interests. For many years he has been active in the National Sand and Gravel Association. He has been a director and a member of the executive committee of the National Ready Mixed Concrete Association since 1958, and this year he was elected treasurer of that organization.

Quentin W. Best

Lime Sold and Used in February, 1961

Lime sold and used in the United States during February, 1961 (885,234 short tons), decreased compared with the previous month, according to reports by producers to the U. S. Bureau of Mines.

Agricultural, construction, and chemical and other industrial lime decreased and refractory lime increased. Open-market lime constitutes approximately two-thirds of the total lime reported; the remaining one-third is captive tonnage.

Lime Sold and Used by Producers[1] in the United States, in Specified Periods of 1960-61, by Types and Major Uses in Short Tons

	January[2]	February		January-February	
	1961	1961	1960	1961	1960
By types:					
Quicklime	722,664	708,867	787,733	1,431,531	1,564,922
Hydrated lime	184,996	176,367	194,165	361,363	390,635
Total lime	907,660	885,234	981,898	1,792,894	1,955,557
By uses:					
Agricultural:					
Quicklime	2,337	1,269	2,213	3,606	4,411
Hydrated lime	3,524	4,534	5,446	8,058	9,616
Total	5,861	5,803	7,659	11,664	14,027
Construction:					
Quicklime	5,375	5,194	6,189	10,569	12,793
Hydrated lime	62,227	58,093	60,806	120,320	122,109
Total	67,602	63,287	66,995	130,889	134,902
Chemical and other industrial:					
Quicklime	596,443	582,482	556,147	1,178,925	1,095,594
Hydrated lime	119,245	113,740	127,913	232,985	258,910
Total	715,688	696,222	684,060	1,411,910	1,354,504
Refractory (dead-burned dolomite)	118,509	119,922	223,184	238,431	452,124

[1]The monthly canvass excludes the output of plants producing less than 10,000 tons a year. [2]Revised figure.

Heavy Equipment Ordered For New Operation Of Bethlehem Limestone

In connection with the construction of its sinter sand and commercial stone plant facilities, the Hanover (Pa.) quarries of Bethlehem Limestone Company, a division of Bethlehem Steel Company, is installing two Allis-Chalmers crushers and ten screens.

The Hydrocone crusher will reduce limestone of various sizes. The ten 6- by 16-ft. single-deck Ripl-Flo screens will be installed back-to-back in two rows of five each. They will be equipped with an oil-mist lubrication system and driven by 10-hp. 60-cycle, totally-enclosed, fan-cooled motors.

National Insulation Month Set by Vermiculite Institute

The Vermiculite Institute, Chicago, is sponsoring September as National Insulation Month, which has been listed in the roster of special days, weeks, and months originated by the United States Department of Commerce. This will be the first observance of National Insulation Month.

"We are asking for the active cooperation of all insulation manufacturers, building material dealers, and the heating and air conditioning industries," says Edward R. Murphy, managing director of the institute, "so that September will become as closely identified with insulation, in the public mind, as April and May are with 'Clean Up-Paint Up.' "

Two new operations have been reported in Virginia. Production has begun at the plant of Southern Materials Company, Inc., near Cheriton, Northhampton County. W. E. Graham and Sons, Division of Vulcan Materials Company, has opened a quarry near South Boston, Halifax County, for the production of crushed stone.

American-Marietta's Superior Stone Division recently opened its crushed stone plant at Lexington, N. C. Initial capacity of the new facility is 300 t.p.h.

JOY
has the right
DRILL for

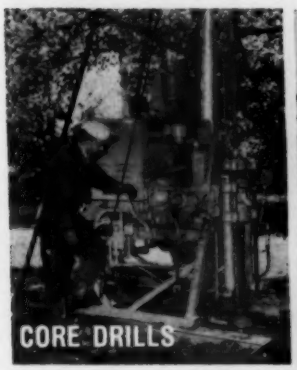
CORE
TRUCK MOUNTED
CHAMPION
CHALLENGER
TRAC DRILLS
DRILLMOBILE
HAND HELD

Drilling costs can be kept down only by carefully matching the drill to the job. With the experience gained in working with the industry's most complete range of drills, your Joy representative can show you how to cut drilling costs to the absolute minimum. For blast holes up to 12¼", he can furnish the drill and mounting which represent the proper combination of production efficiency and equipment investment to handle your job at the lowest possible cost.

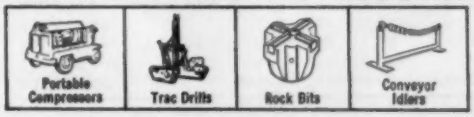
every job

For small jobs, Joy can furnish hand-held, air leg or wagon drills with low equipment costs. Mass production of medium-sized holes can best be handled by one of the five types of Joy Trac-Drills, which provide as little or as much in the way of power controls as is justified by your operation. Where rotary drilling is practical, Joy truck-mounted drills will be the economical answer. Big blast holes can usually be drilled most economically with the big Joy Champion Rotary Drills.

See your Joy representative whenever you have a drilling job to be done. He can give you the right equipment at the right price to make you money. For more complete information on the Joy line of drills, write for Bulletin 2825-26.



EQUIPMENT FOR QUARRYING . . . FOR ALL INDUSTRY



JOY

Joy Manufacturing Company
Oliver Building, Pittsburgh 22, Pa.

In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario

W. J. Parton

T. C. Foote

E. F. Dotter

Parton Named President, Foote, Dotter Promoted At General Crushed Stone

W. Julian Parton was recently elected president of the General Crushed Stone Company, Easton, Pa., succeeding the late Oscar E. Benson. At the same time promotions were announced for Thomas C. Foote and Edwin E. Dotter. Mr. Foote was named assistant to the president, and Mr. Dotter operations manager.

Mr. Parton had been vice-president, operations, since 1959, and prior to that time had served as assistant to the president and director. Earlier in his career he had been associated with two coal companies in executive positions.

Before his recent promotion, Mr. Foote had served as assistant purchasing agent, purchasing agent, assistant to the vice-president, and most recently general sales manager for General Crushed Stone.

Mr. Dotter assumes his new duties after having served the company as general superintendent since 1954. Previously he had been plant superintendent at several of the firm's operations and also assistant general superintendent.

Special Type of Paper Bag Scores High in Tests For Breakage, Slippage

Packaging cement in bags made of extensible kraft paper has brought economies in materials handling and shipping operations at Missouri Portland Cement Company in St. Louis. The paper, known as "Expanda-Kraft," was introduced primarily for multiwall bag and other heavy-duty packaging applications by the Hollingsworth & Whitney Division of Scott Paper Company.

By switching to bags made of this extensible paper, Missouri Portland reported that in-transit breakage has been reduced by as much as 50 percent. In addition, damage claim costs per shipment have been reduced substantially; and stacking is improved because the paper has a resistance to slippage, which reduces bag sliding during shipment.

Before changing to extensible bags, Missouri Portland conducted a comprehensive test program to subject the bags to rigorous handling in the plant, and rough "humping" enroute to customer locations. In the test, bags made of Expanda-Kraft performed well.

Further proof was obtained from drop tests designed to compare breakability limits of the two types of bags. Results again favored the extensible bags.

The extensible bags used by Missouri Portland Cement Company have one less ply and a lower basis weight than other multiwall bags previously used; but the toughness and stretchability of the new type has accounted for less breakage.

Canadian Industrial Minerals Top $500 Million in 1960

Production (shipments) of industrial minerals in Canada increased in 1960 by 1.5 percent, attaining a record valuation of $503,967,000. Substantial gains were recorded in non-metallic minerals; and new production records were established for asbestos, nepheline syenite, elemental sulphur, and sodium sulphate.

Recent statistics for 1959 and 1960 shipments and valuations of major nonmetals follow:

The Canadian cement industry continued to expand. The completion of a new plant and additions to others increased productive capacity by 14 percent and brought the total output to 8,500,000 short tons in 1960. This was 35 percent above the 1959 volume.

Shipments of gypsum from Canadian producers declined by about 10 percent.

The asbestos industry had a record year, with shipments 6 percent above the 1955 all-time high.

	1960		1959	
	Short tons	$	Short tons	$
Barite	155,506	1,446,621	238,967	2,254,582
Fluorspar	—	1,958,236	—	1,850,497
Gypsum	5,161,000	9,308,340	5,878,630	8,393,703
Lime	1,533,673	17,037,970	1,685,725	21,304,021
Nepheline Seynite	249,200	3,030,300	228,722	2,930,932
Salt	3,206,164	18,644,203	3,289,976	18,034,522
Silica	2,235,795	3,322,284	2,163,546	3,436,730
Sulphur (elemental)	254,729	4,679,382	145,656	2,620,787
Clay Products	—	40,042,494	—	42,515,448
Cement	5,697,859	91,111,862	6,284,486	95,147,798
Sand and Gravel	189,961,321	110,086,610	185,123,746	104,651,461
Stone	43,404,986	56,678,612	46,439,535	60,958,784

ALLIS-CHALMERS

How screens help you win the battle of the specs

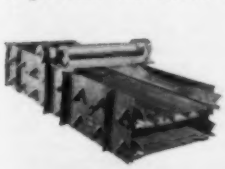
Meeting specifications can put the pinch on profits in a hurry in the aggregate business. To make profits, you need the most efficient screens . . . screens that give top performance, low maintenance and operating costs.

Scalping, sizing, washing, rinsing — all of these screening operations get individual attention from A-C engineers. Years of experience in handling specification problems like yours have resulted in a wide range of screen sizes and features, making it possible for A-C to provide the exact screen to fit your application.

Whether you're replacing obsolete equipment or building an entirely new plant, the right screens can help you cut down costs and produce more aggregate that meets specification.

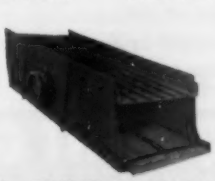
Let A-C engineers tackle your screening problems. Simply send them to us and Allis-Chalmers will submit an engineered recommendation on the most economical screen for your particular job. **Allis-Chalmers,** *Industrial Equipment Division, Milwaukee 1, Wis.*

Aero-Vibe, Low-Head, Ripl-Flo and ROM are Allis-Chalmers trademarks. A-1352



AVS Aero-Vibe inclined screen for economical sizing, up to 1½ inches, wet or dry.

Low-Head horizontal screen for efficient coarse to fine sizing (wet or dry), rinsing, washing, dewatering, media recovery.



XH Ripl-Flo inclined screen for cost-saving scalping and coarse sizing, wet or dry.

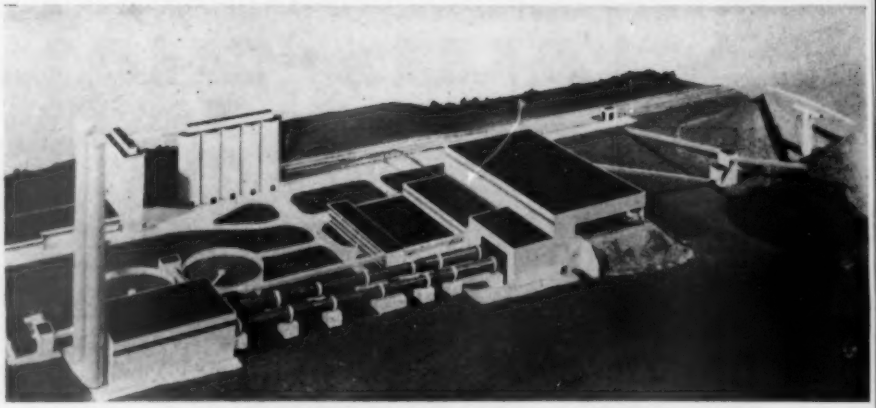
SH Ripl-Flo inclined screen for light scalping, coarse or fine sizing (wet or dry), rinsing or washing.

XXH ROM inclined screen, a brute for tough primary scalping jobs and high tonnage.

Heavy Equipment Ordered, Financing Arranged For Atlantic Cement Plant

According to Dr. Bernard Ulrich, president of the newly formed Atlantic Cement Company, Inc., New York, who is also project director, construction of the firm's plant is under way at a site near Ravena, N.Y. Clearing of the land begun, and orders for heavy equipment have been placed.

Two 13- by 38-ft. raw grinding mills will be used in the wet process

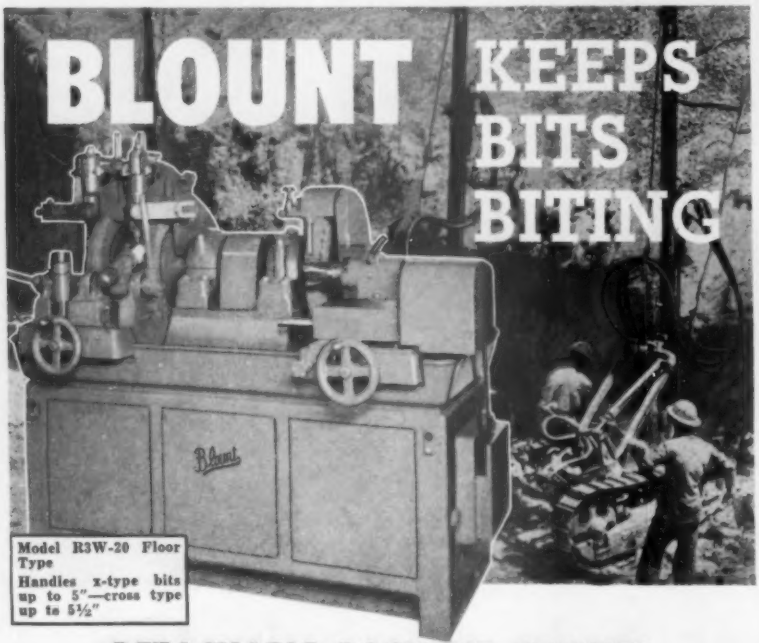


A model of the $64,000,000 plant under construction for the Atlantic Cement Company at Ravena, N. Y.

operation, each driven by a 3,000 hp. motor. The slurry produced will be stored in two 150-ft. diameter basins. Two 585-ft. kilns with 18- by 17- by 20-ft. diameters will be installed. Three 13- by 36-ft. finish grinding mills, also driven by 3,000 hp. motors, will be used in the finish grinding department.

Financial arrangements have been completed with the Prudential Life Insurance Company and a group of commercial banks, including the Chase Manhattan Bank.

Full-scale production is expected to begin early in 1963. It was indicated that when the plant and distributing stations are fully operative, approximately 250 workers will be employed.



DETACHABLE ROCK BIT GRINDER CUTS DOWN-TIME – LENGTHENS BIT-LIFE

BLOUNT machine-sharpens carbide-tipped rock drills far more accurately than any operator, however skilled, can by hand — and up to five times faster!

When you recondition your rock bits on a BLOUNT GRINDER, you can be sure of a uniform, symmetrical grinding job, including the exact angles the manufacturer intended.

Put a BLOUNT GRINDER to work for you, and get the savings so many customers report!

- ★ Longer bit-life — more regrinds per bit
- ★ Faster drilling
- ★ Reduced drilling upkeep
- ★ Lower cost per foot of drilling

PARTIAL USER LIST
Blount Bit Grinders:

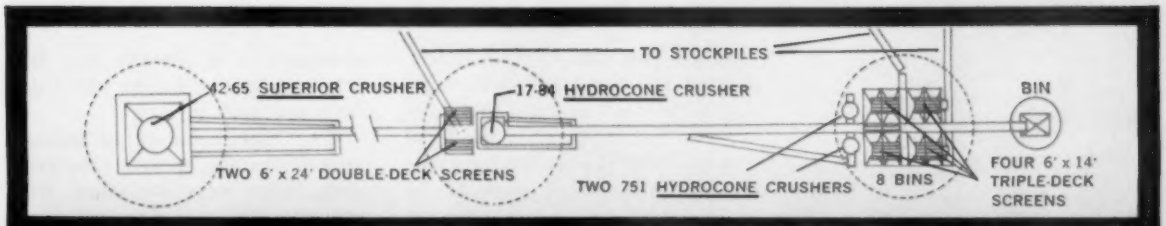
National Asbestos Mine Company, Quebec
Peter Krewit Sons Company, Oregon
Liberia Mining Co., Liberia, W.A.
Stockbridge Stone Co., Georgia
Quebec Cartier Mining Co., Quebec
Orinoco Mining Co., Brazil
Tata Iron & Steel Ltd., India
Marquette Iron Mining Co., Michigan
Oroville Project Contractors, California
Inspiration Consolidated Copper Co., Arizona
Quebec Hydro Elec. Com., Quebec

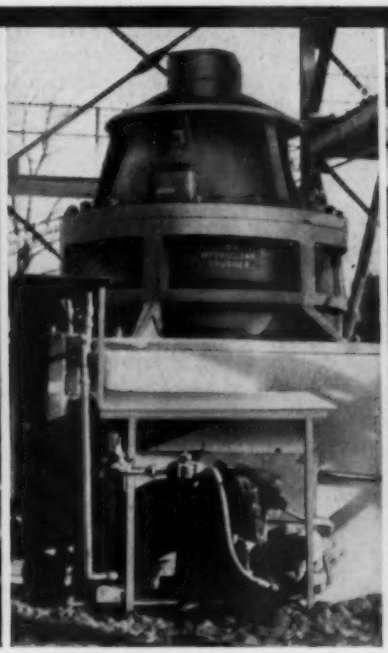
J. G. BLOUNT Co.
Everett 49, Massachusetts
Div. Bowl-Mor Co., Inc.

Enter 42 on card, page 177

● Howard Pyle, right, president of the National Safety Council, presenting William A. Wilson, president of Pit and Quarry Publications, Inc., with a Public Interest Award for 1960 in recognition of PIT AND QUARRY'S contribution to promotion of safety. This plaque is the latest of a series of nine such annual awards received by PIT AND QUARRY. The plaques are awarded for exceptional service to safety promotion by organizations in the mass communications field.

ALLIS-CHALMERS





Superior, Hydrocone and Hydroset are Allis-Chalmers trademarks.

Rugged Hydroset control sets a fast pace for crushers:

900,000 tons in 4½ months!

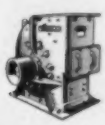
Crushing trap-rock is a tough assignment. A tight time schedule makes it even tougher for Chantilly Crushed Stone Company. They were awarded the contract for all of the crushed stone — base course and concrete specification stone — for the new $75,000,000 John Foster Dulles Airport just outside Washington, D. C.

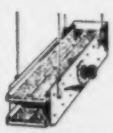
To meet production requirements, they had to have crushers that were rugged and dependable. Crushers that would provide rapid compensation for the wear that always accompanies the crushing of trap-rock. Crushers that would *not* require extensive downtime to unload in the event of power failure.

To get the job done, Chantilly built their plant around four Allis-Chalmers crushers: a 42-65 *Superior* gyratory for primary crushing, a 17-84 *Hydrocone* crusher for secondary crushing, and two 751 *Hydrocone* crushers for tertiary crushing. All four crushers were equipped with *Hydroset* control.

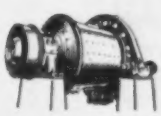
It was *Hydroset* control that made compensations for wear in minutes, not hours... made the quick changes in product size from base course to concrete specs.

Ask your A-C representative about the rugged flexibility of A-C crushers equipped with Hydroset control. Or write **Allis-Chalmers,** *Industrial Equipment Division, Milwaukee 1, Wisconsin.* A-1336


Hammer Mill


Vibrating Screen

Jaw Crusher


Grinding Mill

Kiln

W. B. Paynter Jr., Kentucky-Virginia Stone Company, Middlesboro, was elected president of the Kentucky Crushed Stone Association during the group's recent annual convention.

State Highway Picture Drawn for Kentucky Producers

OFFICIALS involved in highway construction in the state of Kentucky pulled no punches in describing some of the road program problems for the members of the Kentucky Crushed Stone Association during that group's recent annual convention in Louisville.

Lack of systemized planning is delaying work on many roads throughout Kentucky, according to Henry Ward, highway commissioner. He emphasized that the criticism is not directed at highway department personnel, but at the complete lack of a system that would co-ordinate the efforts of engineers in the various divisions of the department.

The lack of such a systematic approach also makes it virtually impossible, according to the commissioner, to estimate in advance the quantities of materials required—a situation that has a direct bearing on the aggregate producers.

Other current difficulties could have been avoided by proper planning in the past, it was noted. Inadequacy of base construction and right-of-way encroachments are among the factors delaying the letting of (resurfacing) contracts—even with money available. Mr. Ward opposes the spreading of thin surfacing on inadequate bases.

It was implied that much of the necessary planning would be done within the framework of the newly organized districts, and that it would not yet be possible to indicate when resurfacing programs would start.

In a similar vein, T. J. Hopgood, director of maintenance in the highway department, indicated that prospects for the remainder of this fiscal year (to June 31) are not outstanding. The amount of work to be placed under contract depends on the new state budget. However, it was predicted that the maintenance division would require slightly more than 1,000,000 tons of crushed stone during the last nine months of this year.

Certain Bureau of Public Roads policies involved in federal-aid road construction were outlined by J. C. Cobb, division engineer of BPR. He pointed out that development of an acceptable highway system is difficult when roads are in such bad shape. Nevertheless, BPR specifications on federal-aid road call for adequate base support before surface is applied.

There is no inclination to delay progress, but continuous testing of material and course thicknesses and checks on adequacy of supervision by both the contractors and the state highway department are mandatory. If the work does not measure up to standards, it is possible that federal participation will be withdrawn from any such project.

Two representatives of national associations also spoke to the gathering. They were Joe Gray, chief engineer, National Crushed Stone Association; and Sam O'Masta, vice-president, National Limestone Institute.

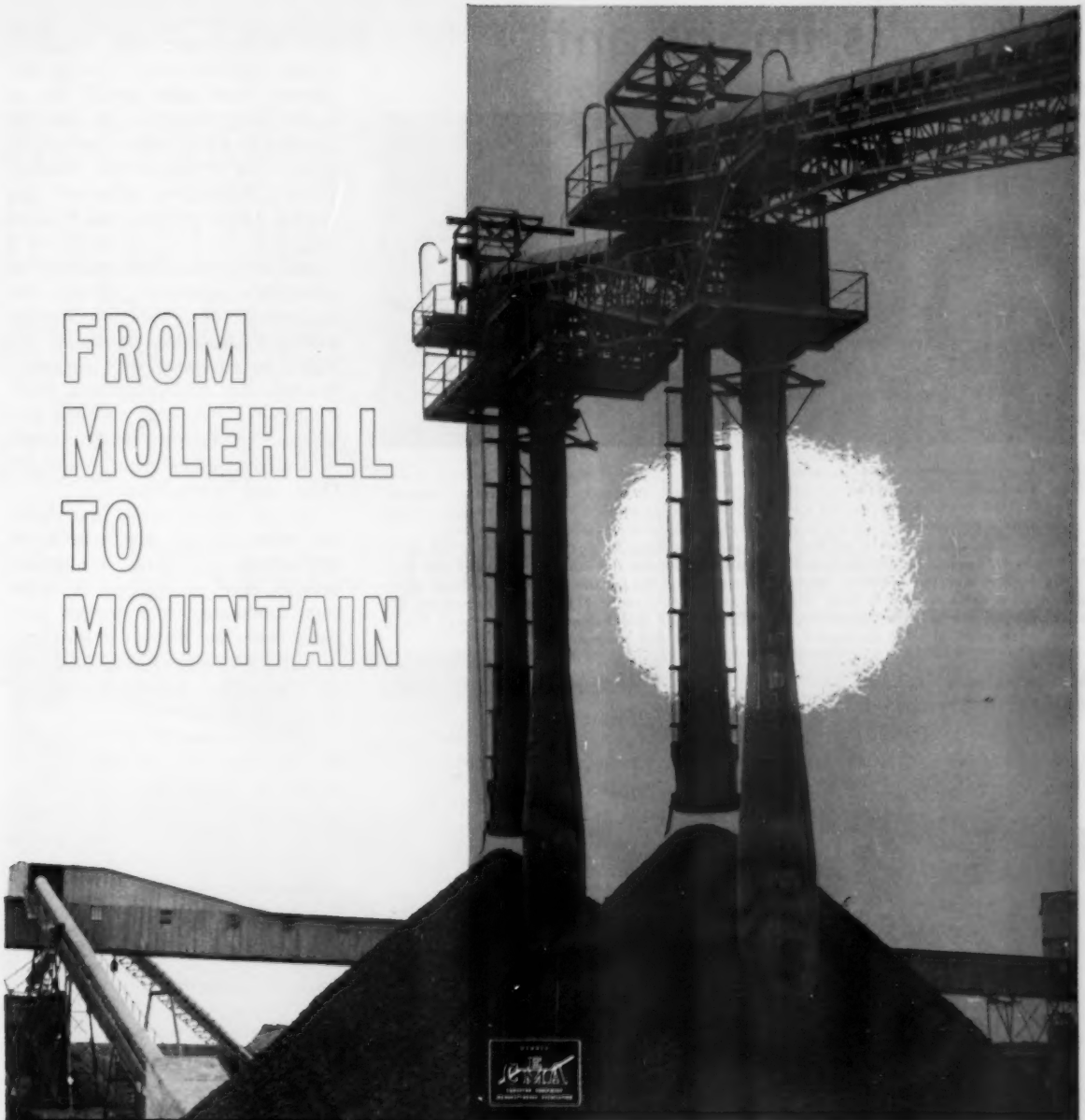
The Kentucky operators named new association officers during their annual convention. W. B. Paynter Jr., Middlesboro, was elected president to succeed W. D. Milne of Louisville.

Norman Wiedmer, Hopkinsville, was elected first vice-president; and W. L. Osborne Jr., Elizabethtown, second vice-president. Miss Margaret McD. Smith, Lexington, was re-elected treasurer; and W. O. Snyder, Frankfort, continues as the group's executive secretary.

Directors of the association include Herman Genet, Greenville; Frank Hamilton, Georgetown; W. R. Harrod, Louisville; David McLellan, Horse Cave; Fabian Mathis, Bardstown; Powell Potts, Franklin; and Mr. Milne.

Association officers and meeting speakers in this group are, front row: W. O. Snyder, executive secretary; Dave Milne, immediate past-president; and Henry Ward, Kentucky Commissioner of Highways. Standing: Joe Gray, chief engineer, National Crushed Stone Association; Sam O'Masta, vice-president, National Limestone Institute; J. C. Cobb, district engineer, Bureau of Public Roads; and T. J. Hopgood, director of maintenance, Kentucky Department of Highways.

FROM MOLEHILL TO MOUNTAIN



A stack piling operation that grows from a molehill to a mountain. Bulk Systems conveyors move tons of shale daily at the Huron Portland Cement Company's Alpena, Michigan Plant—the worlds largest cement producing facility.

In this competitive age, whether your problem necessitates moving mountains of raw material or handling minute quantities of the finished product, unified responsibility for engineering, fabrication and erection of your entire materials handling system remains your most logical and economical choice. Consult the Bulk Systems Division of the Jervis B. Webb Company for your materials handling needs.

BULK SYSTEMS

DIVISION OF JERVIS B. WEBB COMPANY
8951 ALPINE AVENUE
DETROIT 4, MICHIGAN

Safety Is Important

● A number of simple devices—applicable to many types of plants—have helped Armco Steel Corporation to establish a safety record twice as good as the national average. Armco's 1960 injury record was 2.6 lost-time accidents for every 1,000,000 man-hours worked. These simple but effective devices are also applicable in nonmetallic mineral plants.

Left—When cables from a welding unit cross a walkway, a portable shield is set up to eliminate a temporary tripping hazard, and also to protect the cables from wear and tear.

Right—For elevated welding applications, such as this overhead crane runway repair job, a steel cable is used to hold three important safety tools: (1) a fire extinguisher; (2) a safety belt in front of the welder; and (3) a hand line behind him. The hand line is used to lower or raise the equipment to and from the floor below.

Motor Vehicle Safety Laws Passed on State, Natl. Levels

According to a survey conducted by the National Highway Users Conference, legislation requiring motor vehicle seat belts (or their anchoring brackets) has been introduced in the Congress and 16 state legislatures. In four states the regulation of hydraulic brake fluids for greater highway safety is being considered. Seat belts would be required equipment under bills still pending in the Congress and in the legislatures of Connecticut, Hawaii, Illinois, Minnesota, Missouri, Nebraska, Ohio, Oregon, and Wisconsin.

In New York, a bill awaiting the governor's signature provides that registered motor vehicles manufactured or assembled after June 30, 1962, be equipped with necessary brackets for anchoring seat belts. Legislation containing a similar provision, with differing effective dates, is pending in California, Michigan, Ohio, and Pennsylvania.

On the federal level, one House bill would require seat belts meeting certain standards for motor vehicles sold or shipped in interstate commerce; and another provides that the Secretary of Commerce set minimum standards for such equipment without making installation obligatory.

A third House bill would require the Secretary of Commerce to set minimum standards for hydraulic brake fluid. The House Subcommittee on Health and Safety has held hearings on this bill.

Meanwhile, five states (Colorado, Kansas, New Hampshire, Ohio, and Utah) this year have considered bills which would require such brake fluids to conform to the specifications of the Society of Automotive Engineers or similar standards. This kind of legislation is recommended by the Uniform Vehicle Code, and supported by highway user groups across the nation. Twenty-seven states have already adopted brake fluid regulatory legislation in substantial conformity with the Uniform Vehicle Code.

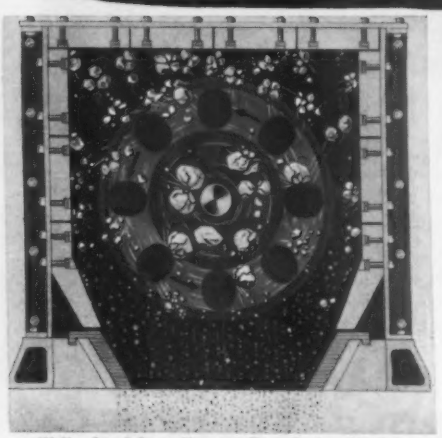
The Kansas proposal passed in both houses, but the Colorado bill was defeated.

American Potash Chemical Corporation's Henderson (Nev.) plant recently received the president's annual safety award for having established the best 1960 over-all safety record among the firm's nine facilities. The National Safety Council's award of merit will also be given to this plant.

SIZE AND UPGRADE YOUR

WET OR DRY AGGREGATES FOR

BOTH CONCRETE and BITUMINOUS MIX with



STEDMAN CAGE MILL

The Stedman Single-Cage Mill reduces Gravel and Stone, either wet or dry, via the Internal-Impact Principle. See cut at left. It pulverizes unsound material to be passed off with fines—the discharged product going to wet screens, log washer, jigs, or heavy media process.

The Stedman Single-Cage Mill not only upgrades your product, but also gives the greatest percent of crushed surfaces for Black Top Mix. Example: "Crush your -2" plus ¼" including pea gravel to a product of ¾" X O, screen out minus ¼" sand and furnish a specification product for Bituminous Mix with 65 to 100% crushed particles."

Write for information on New Design Multiple Cage Mills for producing AG-LIME featuring High Capacities, Low Maintenance.

STEDMAN

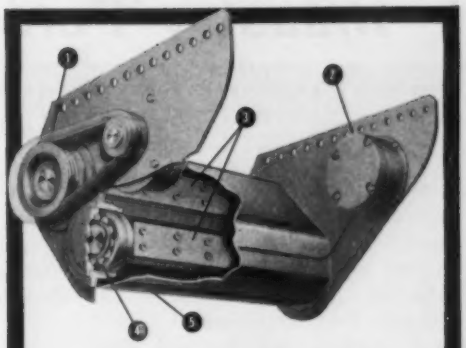
FOUNDRY AND MACHINE COMPANY, INC.

Subsidiary of United Engineering and Foundry Company. Aurora, Indiana, U.S.A.

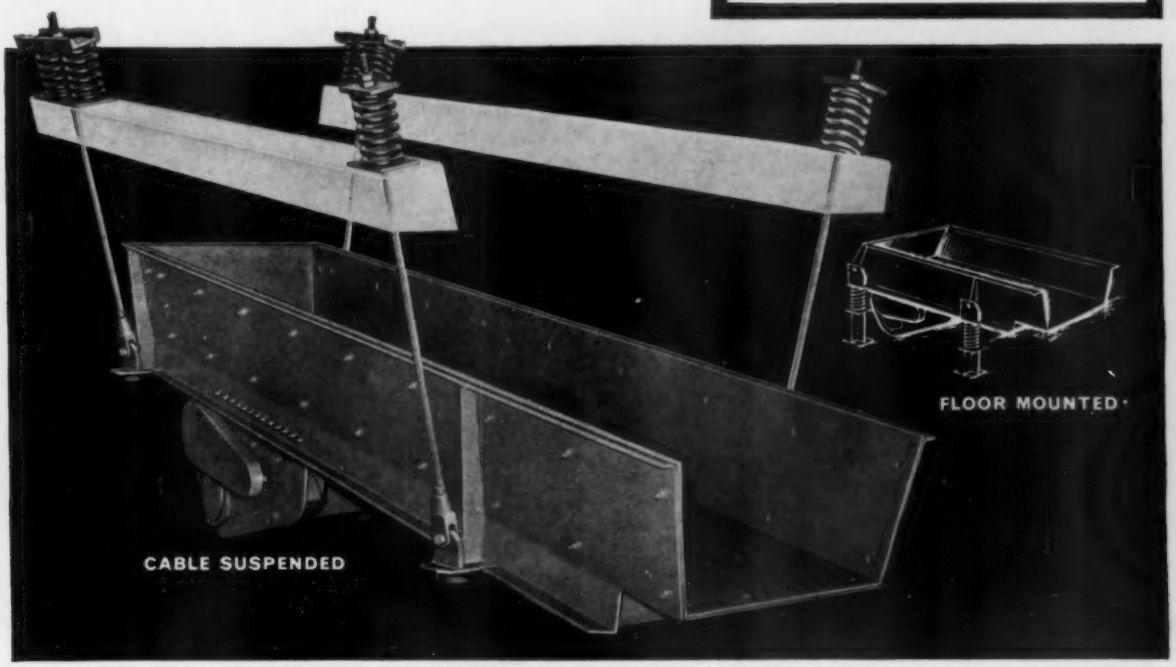
Enter 46 on card, page 177

New LINK-BELT vibrating feeder with *SYNCHROMATIC* vibrator

increases feeding efficiency in all types of material



1. Labyrinth seals provide positive retention of lubricant and protect bearings from dust and corrosion. 2. Pancake motors on Synchromatic vibrators designed to withstand severe pounding of constant vibration. 3. Automatically synchronized unbalanced shafts produce straightline vibrating action. 4. Oversize, self-aligning spherical roller bearings designed to withstand high centrifugal forces. 5. Grease is only lubrication needed because Synchromatic vibrator has no gears.



And it's a glutton for punishment, too. Stands up under the brutal pounding of heavy shocks, load after load after load. Stays right on the job. Keeps a steady, profit-making flow of material going to your other production equipment.

Straightline feeding action is the result of Synchromatic's new principle of vibration. The feeding action is produced by two automatically synchronized unbalanced shafts rotating in opposite directions. Vibration intensity and resulting conveying action can be altered simply by changing the amount of shaft unbalance. The combination of speed, stroke intensity and straightline action results in highly efficient feeding, regardless of material handled.

Put the rugged, efficient new Link-Belt vibrating feeder with Synchromatic vibrator to work for you. Available in capacities to fit your requirements. For complete information and specifications write for Folder 2770. Address LINK-BELT COMPANY, Dept. PQ, Prudential Plaza, Chicago 1, Illinois.

LINK-BELT

VIBRATING FEEDERS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Warehouses, District Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World. 15,420

Industry Personalities

WESLEY H. SOWERS and WILLIAM A. BROWN JR., have been elected members of the executive committee of the board of directors, Vulcan Materials Company, Chicago. Mr. Sowers is president of Vulcan's Frontier Chemical Company Division, Wichita, and Mr. Brown is executive vice-president of Construction Materials, Midwest.

Mr. Sowers was also elected executive vice-president of Chemical and Metallics, Vulcan Materials.

D. M. (MILT) WHITLEY has been promoted to the position of vice-president in charge of sales for Arizona Portland Cement Company, Rillito, Ariz. (Arizona Portland is a subsidiary of California Portland Cement Company.) A new sales office has been opened at Phoenix. Mr. Whitley has been with the firm since 1952, and has been in the Phoenix sales office since 1957.

H. Riefenstahl

HOWARD RIEFENSTAHL, manager of safety and training for Alpha Portland Cement Company has been appointed chairman of the Portland Cement Association's Accident Prevention Committee for a two-year term.

In his post with the P.C.A. committee Mr. Riefenstahl will participate in safety projects with 51 committee members representing 178 cement plants. The committee will conduct regional safety meetings, issue a safety publication, and recommend improved safety training methods.

D. R. File

DONALD R. FILE has been appointed manager of the Rochester (Pa.) plant of Dravo Corporation's Keystone Division. Mr. File, who has been a salesman in the division since joining Dravo in 1951, succeeds RAYMOND J. GRAB who has retired.

W. B. W. Wilson

H. P. EELLS JR., president of Basic Incorporated, announced his resignation as treasurer of the firm. At the same time he made public the election by the board of directors of WALTER B. W. WILSON to the post he vacated.

Since joining the company in 1956, Mr. Wilson has held various administrative posts including vice-president of the company's Tiger Brand Division.

WALTER E. CROWTHER, Menlo Park, Calif., has been named director of the newly established personnel department of the Louisville Cement Company. He began working in his new post in the Louisville (Ky.) office on March 13.

As the director of new department, Mr. Crowther is responsible for all personnel activities of the firm and its subsidiaries. He was previously personnel director of the Western Machinery Company, San Francisco, Calif.

TRIAL SAMPLES
Of World-Famous WHITMORE'S Lubricants

OPEN CHAIN LUBRICANT INCREASES CHAIN LIFE UP TO 300%

Penetrates, lubricates, prevents rust. Lubricates deep into chain linkage to reduce friction on pins, rollers, bushings, pressure surfaces. Corrosion inhibitor prevents rust in vital working mechanisms. Lubricates close-tolerance internal surfaces to increase chain life up to 300%. Highly recommended for all climatic conditions to stop rust and corrosion even in salt atmospheres.

Packaged in handy 16 oz. aerosol spray-on containers or in bulk—send for a free trial sample.

ANTI-FRICTION COMPOSITIONS HAVE NO MELTING OR DROPPING POINT

Packaged in 14½ oz. cartridges for handy application with lever-type cartridge guns for constant protection to roller, ball, sleeve bearings and sliding surfaces in "hot" bearing applications or in areas with high ambient heat. Exclusive formulas have no melting or dropping point; moisture resistant; will not wash out; exceptional metal adherence properties; temperature reducing qualities; high extreme pressure values. Available in two grades. Whitmore's Anti-Friction Composition No. 1 (light density), recommended for high speed, high temperature applications. Anti-Friction Composition No. 2 (heavy density), for low-speed high-temperature applications or loosely-fitted bearings. Specify No. when requesting free trial sample.

68 YEARS OF LEADERSHIP LUBRICATING THE FOLLOWING:

- Open Gears, Dipper Sticks, Cams
- Open and Enclosed Chain
- Speed Reducers
- Enclosed Gear Cases
- Roller, Ball and Sleeve Bearings
- Wire Rope and Cable
- Hydraulic Units, Torque Converters

Est. 1893
THE WHITMORE MANUFACTURING CO.
LUBRICATING ENGINEERS
CLEVELAND 4, OHIO • VULCAN 3-7272

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Pre-Engineering by **KAISER ENGINEERS** answers basic plant expansion questions...

Raw Materials? Your final decision to expand or build results from a series of important individual decisions. Raw material availability is one of them. Independent analysis of all aspects of your proposed program is the *Pre-Engineering* service offered by Kaiser Engineers. In addition, KE is an experienced designer and builder of all types of facilities for the Minerals industry. From Pre-Engineering through design and construction Kaiser Engineers provides complete one-company service and ingenuity based on years of experience.

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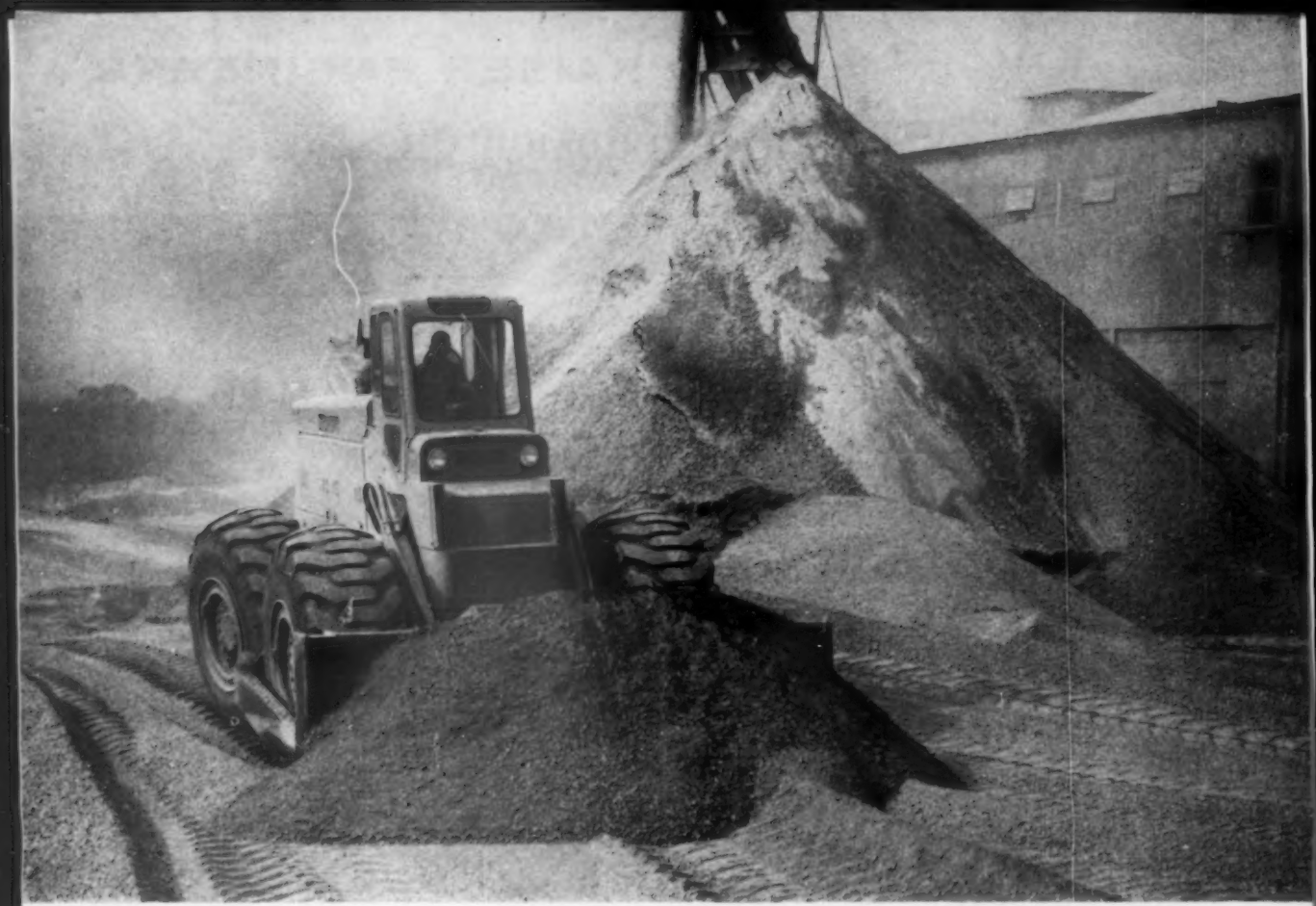

At pug mill, Michigan Dozer moves 550 tons hourly up to 150 feet.

Major Southern quarry chooses Michigan Tractor Dozer for top-production job

375 hp model feeds 550 tons hourly to pug mill

Same unit also handles shovel and blast cleanup in pit ½ mile from mill.

At its top rate, this Michigan Tractor Dozer moves 550 tons of crushed stone an hour!

Pushes, one-way, range up to 150 feet.

Same unit also cleans spillage around two rock shovels located ½ mile away.

It alone does the work of two 50,000 lb class crawler dozers.

Owner: Lambert Brothers Division of Vulcan Materials

The Dozer is a 375 hp, 74,000 lb Model 380 Michigan. It is owned by Lambert Brothers Division of Vulcan Materials Inc, Birmingham, Alabama, one of the nation's largest stone pro-

New Michigan Tractor Shovel, latest of 15 owned by Lambert, truck-loads 3,500 tons daily

One of Lambert Bros 15 Michigan Tractor Shovels. This unit, a new Model 175A with 3¼ yd bucket, handles all truck-loading, also dresses stockpiles in Lambert's Nashville quarry. It loads 200 to 250 trucks, 3,000 to 3,500 tons per 8-hour day. Each pass—2700 lb/yd 3" stone down to —100 filler dust—averages 4 tons, each load cycle takes 20 to 30 seconds. Unit works out of 25 stockpiles, scattered over 100 acres. Furthest run is ¼ mile—easy for the Model 175A's fast rubber-tired speed of 27 mph.

ducers. The Lambert Division alone operates 25 quarries in Tennessee, North Carolina, Kentucky, and Virginia; they are using this Dozer in their 80 acre pit near Nashville.

The story starts last summer. Harold and Glen Lambert had just installed the pug mill and needed something to feed it. Their existing crawler dozer wouldn't do, it obviously didn't have the mobility to do both pit cleanup and mill feeding. Another big *crawler* would be needed, it seemed. Then Nashville distributor McCarthy, Jones & Woodard suggested a rubber-tired Michigan Tractor Dozer. One was tried. The problem was solved. From four available sizes, a 375 hp model was chosen as best suited to the need (the other size Michigan Dozers: 162, 262, and 600 hp).

Main jobs: feed mill, clean around shovels

The 375 hp machine has been busy ever since.

Most of the time it works at the pug mill—dozing out into a stockpile from the feeder belt when the mill isn't running—feeding when the mill is running at a higher rate than available plant production (half or more of the crushed rock is fed into trucks and hauled to regular stockpiles).

Four to eight times a day, the 25 mph Michigan leaves the mill and drives down blacktopped roads to the quarry for shovel cleanup. Unit makes the ½ mile trip, which took crawlers 20 minutes or so one-way, in 2 to 3 minutes.

50% cut in shovel cleanup time

In the pit, the Michigan saves more time (and money). Back in Lambert Brothers crawler days, a good operator could clean the spillage around one shovel in 5 or 6 minutes. Today, their high-speed Michigan does each cleanup in 2 to 3 minutes.

50% cut in blast cleanup time

Another example of time saved is in blast cleanup. Once or twice a week, Lambert's crew shoots the 90 ft high quarry face. Each blast breaks about 22,000 tons of limestone, throws some rock as far as 600 ft. Used to take a crawler 45 minutes to an hour of full-time work to police the area. Now, the Michigan Tractor Dozer cleans up in 20 to 30 minutes.

Sound worthwhile for *your* job? Why not check first-hand? Drop us a line—or call—we'll show you a Michigan Tractor Dozer in action so you can judge for yourself.

Travel speed, job to job over pavement, reaches speeds of 25 mph.

Michigan is a registered trademark of

CLARK EQUIPMENT COMPANY
Construction Machinery Division

CLARK® EQUIPMENT

2479 Pipestone Road
Benton Harbor 18, Michigan

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Canadian Clark Ltd.
St. Thomas, Ontario

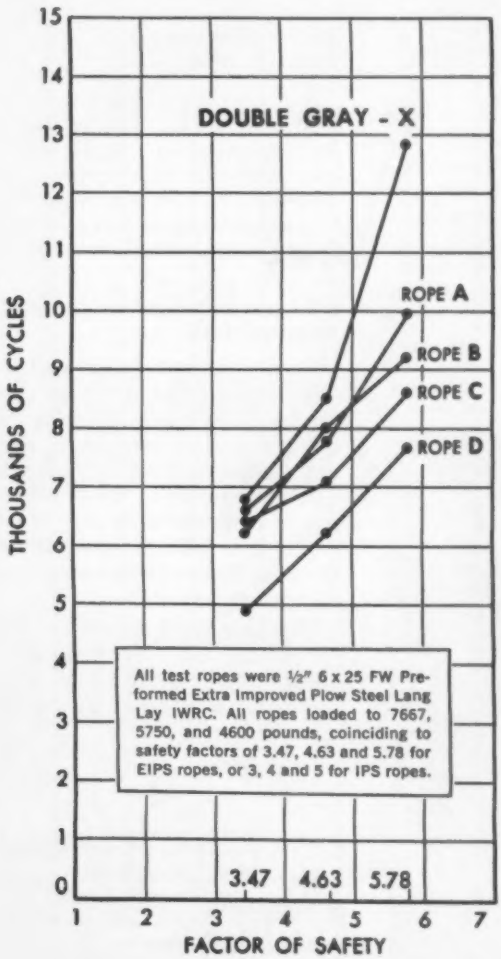
Enter 50 on card, page 177

DOUBLE GRAY-X® lasts longer

Tests prove CF&I-Wickwire's premium wire rope has 45%* more bending life than average of other ropes tested

In an extended series of tests conducted at CF&I's Palmer Plant, five brands of wire rope were tested to destruction on a 25,000-pound fatigue machine that bends wire rope back and forth over sheaves until it breaks.

All the ropes tested were made by major manufacturers, and were identical in size and specification. And all exceeded the catalog-breaking strength of extra-improved plow steel rope. But, as the chart indicates, one rope outlasted all the others at every safety factor used in the test. That rope was Double Gray-X!


DOUBLE GRAY - X
ROPE A
ROPE B
ROPE C
ROPE D
THOUSANDS OF CYCLES
FACTOR OF SAFETY
3.47
4.63
5.78
All test ropes were ½" 6 x 25 FW Preformed Extra Improved Plow Steel Lang Lay IWRC. All ropes loaded to 7667, 5750, and 4600 pounds, coinciding to safety factors of 3.47, 4.63 and 5.78 for EIPS ropes, or 3, 4 and 5 for IPS ropes.

At the highest and most commonly-used safety factor, CF&I-Wickwire's premium wire rope lasted 30% longer than the rope that survived next longest, and 68% longer than the rope that lasted the shortest length of time. Double Gray-X lasted 45% longer than the average of all other ropes tested at this safety factor.

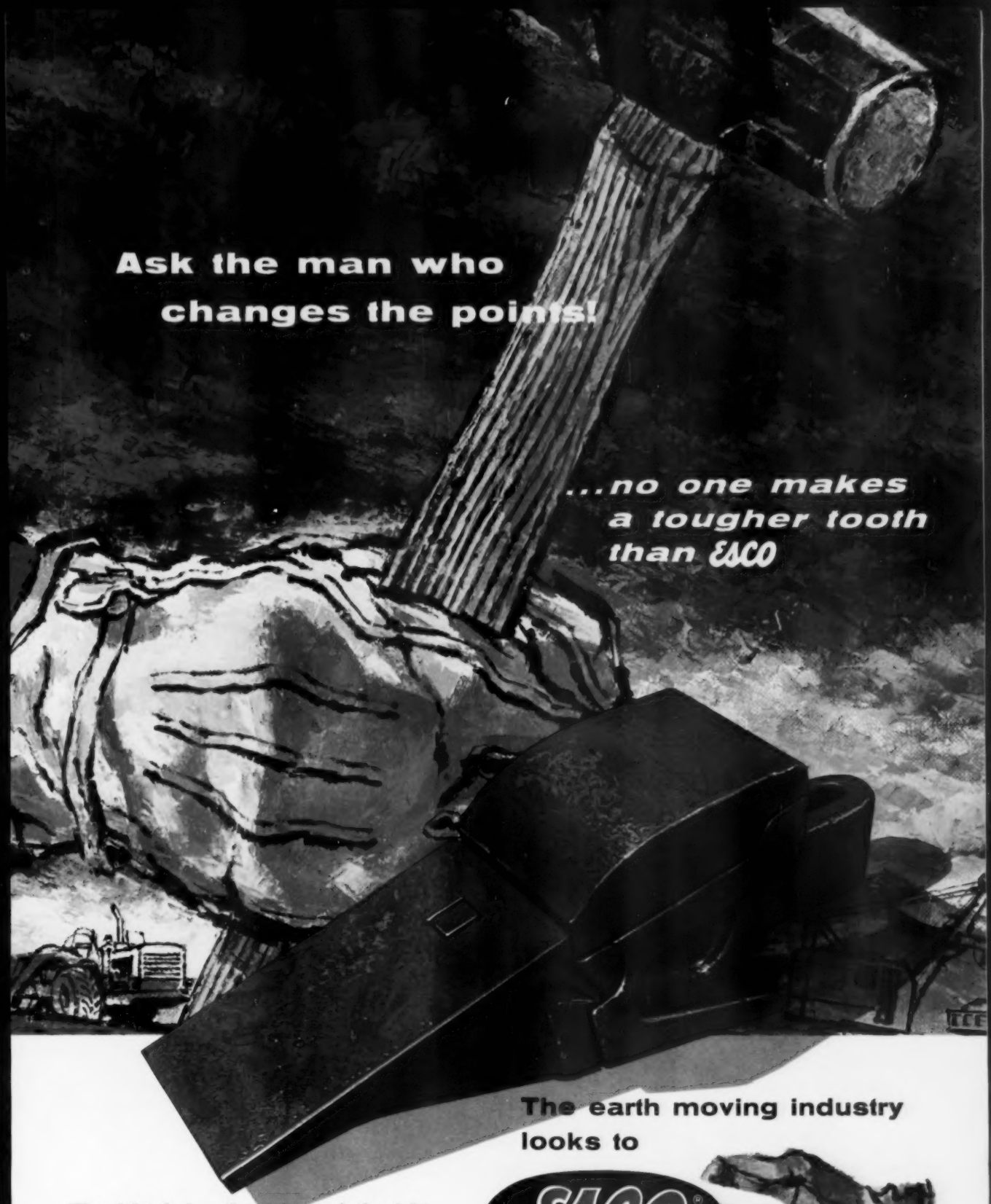
Double Gray-X has greater resistance to bending fatigue, the chief enemy of wire rope life, because it is the result of a breakthrough in wire-drawing technology. The use of molybdenum disulphide in the drawing process produces these outstanding fatigue-resistance factors:

- A Molecular Shield . . . which prevents the wires from grinding together as the rope operates.
- Smoother Wire Surfaces . . . providing better resistance to fatigue.
- Extra Toughness . . . because molybdenum disulphide helps preserve the inherent toughness of the wire during drawing.

Double Gray-X can save you money because it lasts longer on even the most punishing jobs, as proved by these tests and by field reports from satisfied users. This longer-lasting wire rope cuts repair and replacement costs, lowers your total wire rope investment and reduces machine downtime. Use the wire rope of *tomorrow* today! Ask your CF&I salesman for complete details.

*Percentage above average of all other wire ropes tested at safety factor of 5.78.

The Colorado Fuel and Iron Corporation
Denver • Oakland • New York
Sales Offices in All Key Cities



The earth moving industry looks to

ESCO®

The right design, the right steel, the right shape make *ESCO* Two Piece Teeth right for every digging condition.

ESCO Corporation
PORTLAND, OREGON and DANVILLE, ILLINOIS

See reverse for shapes and size range >

Here are the points to remember...

Each easy-to-change ESCO Point is Brinell tested to assure exactly the right degree of shock-absorbing toughness and abrasion-resisting hardness for longer life. Abrasion resistant Wear Caps (illustrated) extend adapter life.

12M ALLOY STEEL

ESCO 12M Two Piece Teeth are the toughest you can use. Developed through years of research for the earth moving industry, cast *ESCO* 12M is the finest steel made for severe shock and abrasion.

ESCO TWO PIECE TEETH

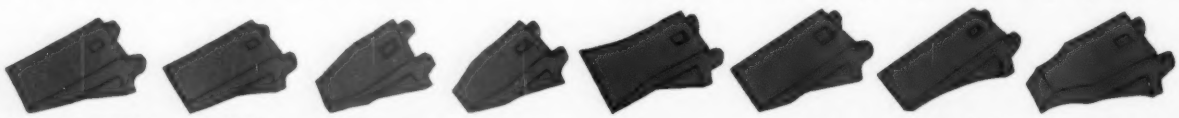
for all your digging equipment

Your *ESCO* dealer can supply two piece teeth for all your equipment. Consult him about standardizing on *ESCO* teeth for the added advantages of quantity purchasing and reduction of on-the-job inventories.

WEAR CAP ADAPTERS

The ESCO Wear Cap Adapter, winner of the Blue Ribbon Mining Award, is the most rugged tooth assembly ever developed for handling tough rock and taconite. Replaceable wear caps sharply increase service life by protecting the adapter from wear. No special pins or welding required.

8 POINT TYPES
FOR EVERY DIGGING CONDITION



GENERAL PURPOSE | ROCK | ROCK PICK | PICK | SHARP FLARED | SHARP | SHARP LONG | RIPPER

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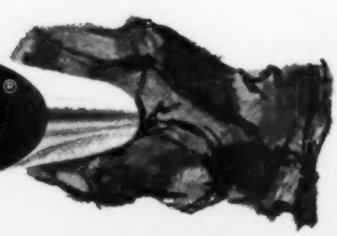


LITHO IN U.S.A.

PROFITABLE EXPERIENCE *makes major cement producer a Long-Time* MANITOWOC *user*

In the Wampum area, limestone averages between 18 and 22 ft. in thickness, and is overlaid by shale which is also recovered for use in the mill. Here, one of two 3-yd. Manitowoc shovels loads broken rock into a 12-yd. truck. The Manitowocs feed a 450-tph crushing-and-screening plant.

Two more Manitowocs handling loading in company's newest quarry

In equipping a quarry serving its new mill at Wampum, Pa., this well-known cement company chose a pair of 3-yd. Model 3600 shovels to excavate shale and limestone. With a fleet of Manitowoc shovels already operating in other company pits, the choice was a natural one. In location after location, when final operating costs are figured, it's the Manitowoc that's handling more rock at less cost per ton than any other loading equipment.

There are good reasons why a Manitowoc shovel gives this kind of performance. Simplicity of design throughout the machine, with fewer gears, gives a Manitowoc full power at the dipper . . . enables it to cut through the toughest material. Long, wide-spread crawlers and a massive one-piece carbody provide needed stability for loading rock at a fast, even pace. Air controls and torque converter drive (available for most models) make the entire dig-and-dump cycle as smooth as it is powerful.

These are only the highlights of Manitowoc advantages that make repeat buyers of quarry after quarry. Your Manitowoc distributor will be glad to give you complete details.

Manitowoc **MANITOWOC ENGINEERING CORP.**

(A subsidiary of The Manitowoc Company, Inc.)

Manitowoc, Wisconsin

SHOVELS — 1¼ to 6 YDS. DRAGLINES — 1¼ to 7 YDS.

1-K

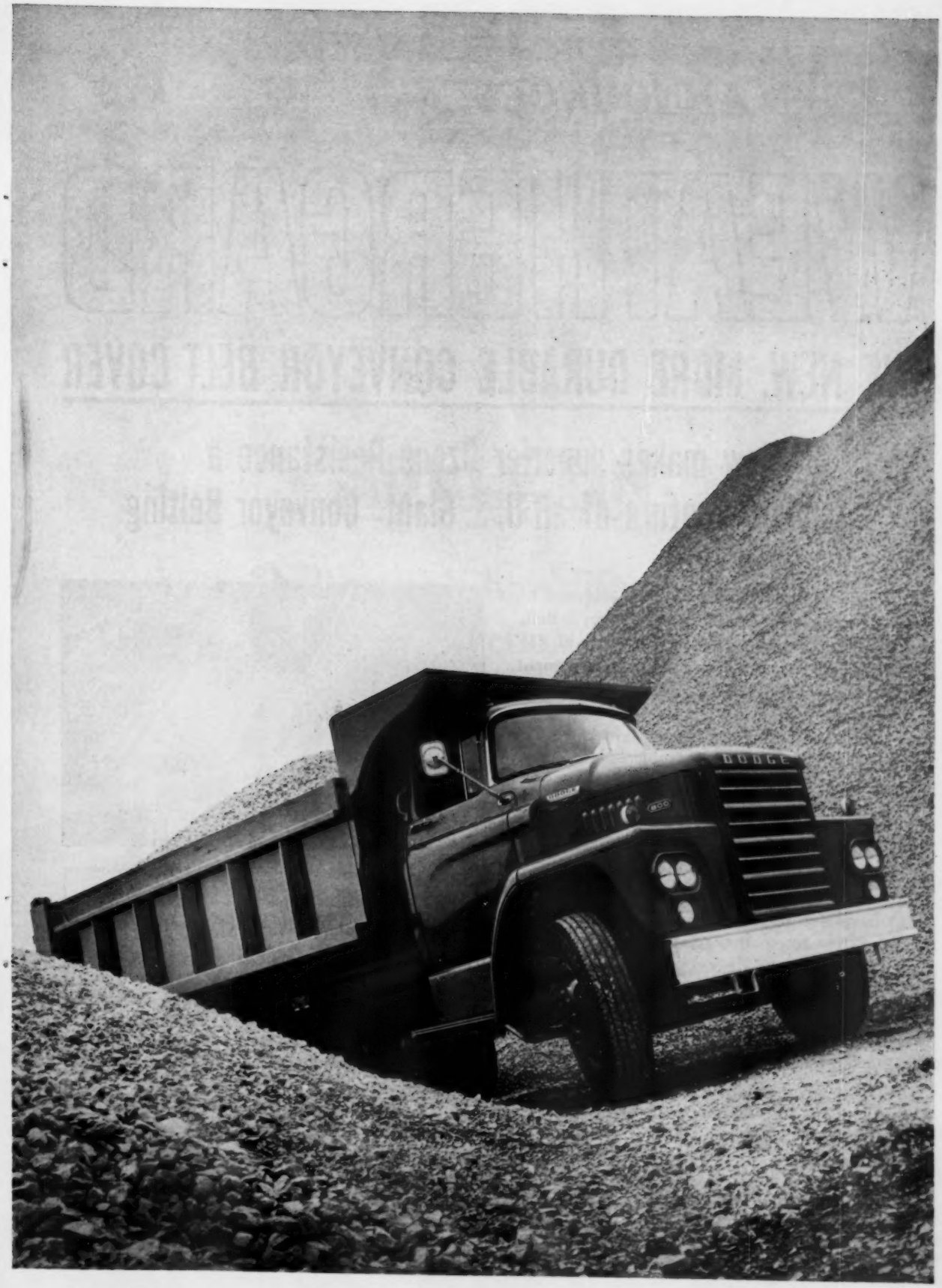
MANITOWOC

A PRODUCT OF CHRYSLER CORPORATION

TOUGHEN YOUR FLEET WITH DODGE HEAVY-DUTIES

Dodge heavy-duty trucks for 1961 are the toughest, stingiest, workingest trucks we've ever built. Engines have been improved, beefed up all 'round. There's V8 gasoline muscle to 228 H.P., and Cummins diesel muscle to 743 cu. in. and 220 H.P. Frames, clutches, transmissions and axles have been strengthened to match. Swing-out fenders let you walk right up to the engine and service it fast. A BBC of 89¾" lets you put more load on less wheelbase, or pull a longer trailer. Those are two advantages of Dodge's cab forward design. Another: the cab simply can't go haywire, nor do you have to raise the roof to accommodate it. If you own a tilt-cab, you'll know what we mean. Toughen your fleet from a big choice of Dodge heavies. Trucks and tractors. GVWs from 19,500 lbs. to 53,000 lbs. GCWs to 76,800 lbs. Two other things to think about. The heavy-duty Dodge for your job is probably waiting your order today at a Dodge Truck Center. And now there's a 24-hour-a-day, seven-day-a-week ordering system for emergency parts. Delivery's soonest!

DODGE BUILDS TOUGH TRUCKS



Enter 56 on card, page 177

US RUBBER **ANNOUNCES**

WEATHERGARD

THE NEW, MORE DURABLE CONVEYOR BELT COVER

Now makes superior Ozone Resistance a Standard Feature of all U. S. Giant® Conveyor Belting

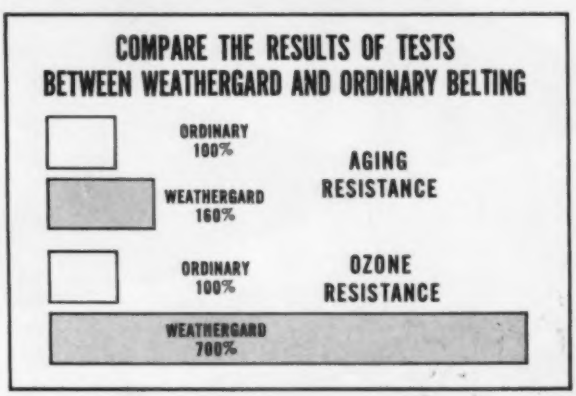
United States Rubber Company has achieved its position as the leading authority in Conveyor Belting through the many "firsts" it has made in this field. Now US brings another major development to Conveyor Belting—the WEATHERGARD cover.

In recent tests, the new WeatherGard cover for Giant Conveyor Belting was subjected to seven times the ozone torture that causes ordinary belt covers to crack and, in turn, fail. The WeatherGard did not crack nor did it give any indication of cracking even after these exhaustive tests.

Further pointing out the toughness and durability of the WeatherGard were tests that showed it to have a substantially greater resistance to cracking from accelerated aging.

In addition, the WeatherGard cover resists damage from smog, sunlight, and weather checking. And . . . besides protecting against these factors that cause ordinary belts to fail, U.S. Giant with its WeatherGard cover is abrasion and wear resistant.

The new WeatherGard cover is standard on all U.S. Giant Conveyor Belting at no extra cost. See your US Representative or Distributor.



WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

US RUBBER **United States Rubber**

MECHANICAL GOODS DIVISION

Rockefeller Center, New York 20, N.Y.

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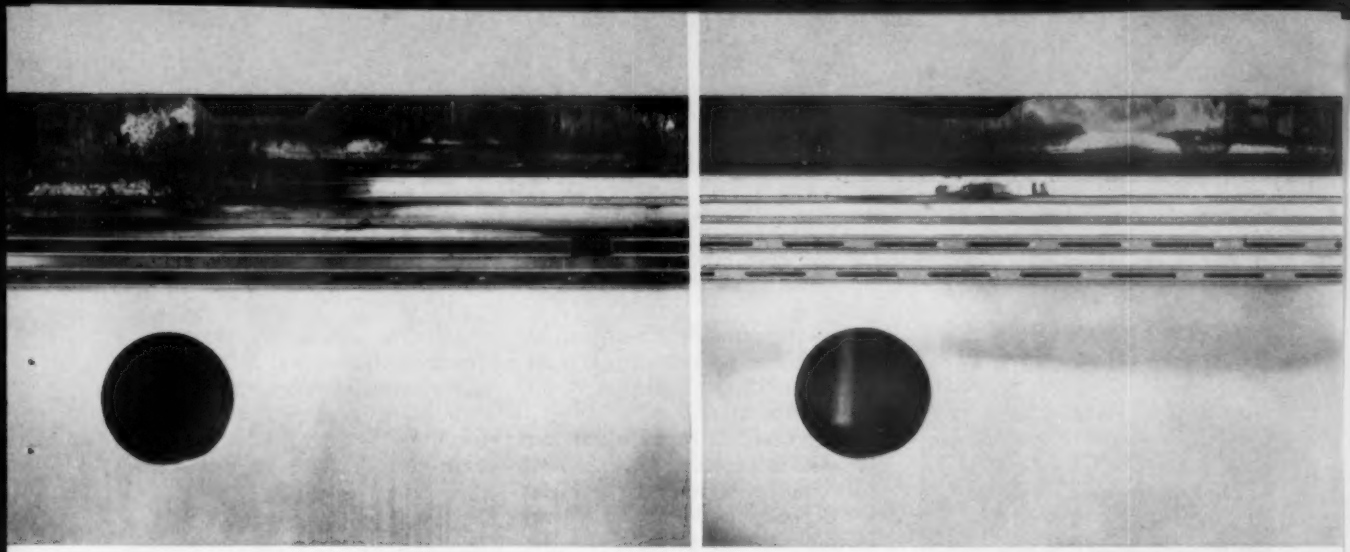


Left: Poor performance of competitive diesel lubricant is easily noted on piston rings.
Right: Superior cleanliness—typical of Shell Rimula Oil performance.

BULLETIN:

Shell reveals how Rimula Oil saved a road construction company $37 per diesel engine on each drain period

A leading road construction company tested Rimula® Oil on a freeway job.

Object: to find an oil that would overcome two key problems in its heavy-duty diesel operations.

1. Heavy engine deposits. 2. Short oil drains.

Read how Shell Rimula Oil tackled these problems, kept the project moving at high speed—and helped to cut overhead.

A LEADING road construction company was having two costly problems with its supercharged diesel engines. Deposits were impairing engine performance. Oil drains were required every 80 hours—far too often for economical operation.

To fight these problems, the company switched to Shell Rimula Oil. After 2000 hours of operation in these same diesel engines, the oil's performance was evaluated.

The company's lube foreman reports these cost-cutting results:

1. Improved engine performance. Shell Rimula Oil greatly reduced lacquer and valve deposits.

Valve mechanisms, bearings, pistons, rings and crankcase were notably free of deposits.

Higher engine efficiency helped the company meet production levels and hold to its maintenance budget.

2. Longer drain periods. With Shell Rimula Oil, the 80-hour drain period was extended to 400 hours. Five times as long.

This saved $37 on labor and oil costs alone, on each engine, each drain period.

Gasoline engines cleaner, too

Shell Rimula Oil has shown some impressive results in gasoline engines, too.

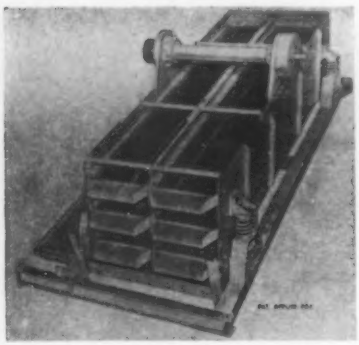
It is well suited for use in gasoline-powered trucks in severe service. If used exclusively, Shell Rimula Oil helps assure clean engines.

For complete data about Shell Rimula Oil, contact your Shell Industrial Products Representative. Or write: Shell Oil Company, 50 West 50th Street, New York 20, N. Y.

SHELL

A BULLETIN FROM SHELL
—where 1,997 scientists are working to provide better products for industry

new machinery



● By splitting the two bottom decks, eight finished sizes can be obtained from the 3-deck Twin Screen manufactured by Aggregates Equipment, Inc.

The new heavy duty inclined 2-bearing vibrating screen (patent applied for) handles crushed stone, sand and gravel, and other granular materials requiring sizing. The range is from crusher-run material to dust.

All moving parts are sealed to protect them from water and dust. The overhead 2-bearing mechanism is easily accessible; can be mounted in a variety of positions, depending on the type of "action" or motion required; and allows sufficient height for passage of primary crusher-run material as well as spray pipe mountings. Wire cloth changes are made by removing bolts from outside the basket and sliding the wire cloth directly out the feed end.

The standard sizes available range from 4 x 12 ft. to 6 x 16 ft., with one or more decks. (350)

● A 4-lb. simplified air sampling device developed by Du Pont determines what harmful substances are present in the air. The unit, for use by industrial hygienists, and air pollution and safety experts is available from Union Industrial Equipment Corporation.

The "Constant Rate Uni-Jet" can be used in explosive or hazardous environments because the unit does not depend on electrical circuits or moving mechanical parts. It does not create a static charge. It can be carried or worn by a workman to collect a continuous sample of the air breathed, without interference of work activity.

For dust sampling, where a particle count or radioactivity survey is desired, a standard filter attachment is substituted for the glass impinger. Dust particles caught on the special filter paper are then counted or measured in microanalytical equipment. (351)

● A wire feed unit, manufactured by Alloy Rods Company, for semi-automatic open-arc hard-surfacing by welding reportedly provides two and a half times the wire supply of the average coil type machine with equal portability and weight.

The Weld-Pak, combined as an integral part of the wire feed unit provides 125 lb. of continuous welding wire.

This feature according to the manufacturer cuts downtime by two thirds, making the Model C—Wear-O-Matic ideal for applications involving many trips to the ground or work platform for new wire.

It also eliminates the short coil loss when a partial coil has to be removed and replaced with a full coil to accomplish a specific job. (352)

● A 2-piece cast cement plug that reportedly saves the time and expense of preparing tamping bags

for large diameter horizontal blastholes has been announced by Austin Powder Company.

Called the Austin ATP plug, it consists of a cone and a base which are loaded as a unit into the hole behind the explosive. To obtain maximum confinement the solid cone is tamped into the base unit, and is thus seated solidly in the blasthole. No additional stemming is necessary. The plug is easier to tamp, in addition to the preparation time saved. As one plug eliminates the need for a number of bags, the device reduces tamping time proportionately.

The ATP plus is available in different sizes for holes from 1 to 10 in. in diameter. The cone and base are shipped and loaded in individual polyethylene bags. (353)

and equipment

for further information use card on page 177

● Said to be the first, a fully transistorized FM radio transmitter that operates on standard 2-way mobile communication frequencies is being offered by Motorola Inc.

The pocket transmitter enables maintenance men, supervisors, and other personnel whose duties keep them on the move to talk to dispatchers, to other portables or miniature receivers, and to mobile radios in a regular 2-way radio system.

The "Handie-Talkie" pocket transmitter can be used on frequencies between 25-54 mc and 132-174 mc, and provides 500 milliwatts RF power output. The dimensions are 5½ x 2½ x 1⅛ in.; weight is 14½ ounces. The unit is completely self-contained, including microphone, antenna, and batteries.

The unit can be operated interchangeably from either nickel-cadmium batteries, or mercury cells. With a 10 percent transmit duty cycle the rechargeable nickel-cadmium supply provides up to nine hours operation per charge, while the replaceable mercury cells last up to 80 hr. Battery chargers are also available. (354)

● A line of corrugated aluminum culvert sheet has been introduced by the Reynolds Metals Company.

The sheet is made from a special alloy designed for maximum corrosion resistance and is available in gauges of .060 in. to .135 in. and in sheet lengths from 28½ to 142½ in. A .165 gauge will be added later in the year. (355)

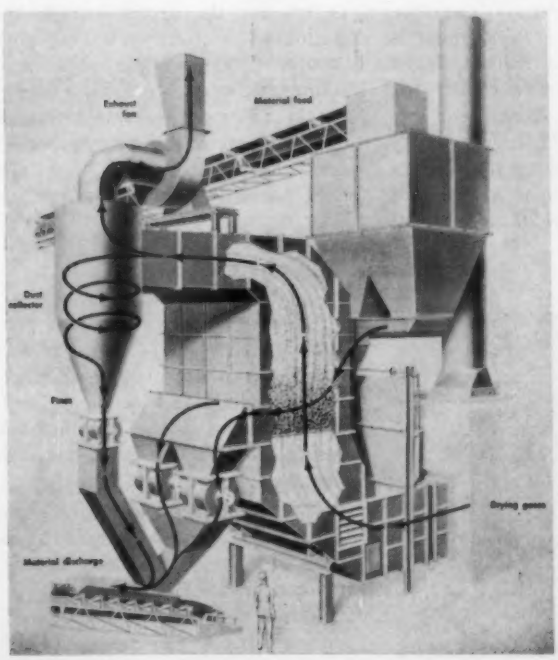
● Trojan primers containing cast pentolite, an extremely dense explosive available from Trojan Powder Company, is impervious to water.

According to the company, it is more powerful than any type nitroglycerine gelatin made.

It has the same safety characteristics as the Trojan line of standard explosives.

Features of the product are: it does not freeze in low temperatures. cannot exude or leak when stored under unfavorable conditions, and contains no nitroglycerine to produce "dynamite" headaches.

These primers are supplied for primary cartridges of non-cap-sensitive explosives and initiating nitrocarbonitrates. (356)



● The Fluid-Flo dryer, for processing granular solids with a minimum product loss or degradation, is available from the Link-Belt Company. The unit can be applied to the processing needs of industries handling rock, sand, and similar granular solids.

The Fluid-Flo dryer consists of a housing and a constriction plate over which the material to be processed is fed by one or more feeders. Hot drying gases are pulled through the constriction plate, under fan-induced draft, causing the material to be suspended in a fluidized mass above the plate. The suspended mass acts like a fluid, and flows horizontally across the plate to the discharge chute. A motorized air lock prevents loss of heat and maintains proper suction.

Exhaust air carries fines through a dust collector, and if desired, these can be recombined with processed materials so that there is no product loss. According to the manufacturer, as material is retained within the dryer for a shorter period of time than with other methods there is minimum product degradation.

The unit is reportedly—with no moving parts—low in maintenance, has high thermal efficiency, and processes materials continuously. It is engineered to fit specific operating and capacity needs, and can be used as a dryer, cooler, or reactor. (357)

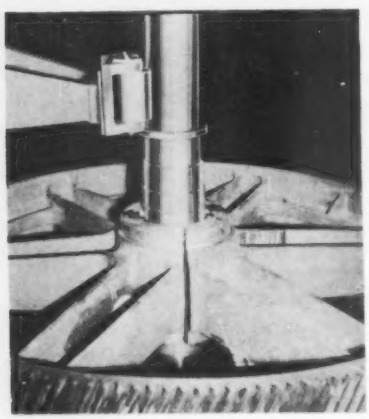
● The Model 271-C, a 1-cu. yd. unit easily converted to dragline, trenchoe, clamshell, liftcrane, and magnet crane front ends has been added to the Unit Crane & Shovel Corporation line of power cranes and excavators.

A feature is the compact swing circle gear assembly with the upper works mounted on a large diameter double live ring of steel balls running in hardened races, which reportedly gives a friction-free fast swing.

A friction-free, fast swing is the result, and with the center pin mounting, hook and turntable rollers, and roller path eliminated, practically no day-to-day lubrication or maintenance is required.

A heat dissipating cooling system has been designed for the swing clutches. Other features include 1-piece main machinery case, automatic traction brakes, full vision cab, disc-type clutches, and involute-splined shafts in upper works and crawlers. (358)

● The rebalancing of such rotatable equipment as pumps, fans, and screws can be accomplished by using



the PortaBalancer, manufactured by Industrial Balancing Engineers Division, Calkins Machine and Tool Works.

An important feature, according to the manufacturer, is that the unit balances heavy rotors to a greater degree of accuracy, and at much less cost.

The center of gravity approach helps solve the dynamic balancing problem.

Heavy balancing reportedly can be done at job site.

The wide runner and glass-hard ball race reduce friction loss. The special carriage makes it possible to balance end-mounted rotors such as the overhung screw conveyors of cement plants.

Capacities are 6,000 lb. and 40,000 lb. (359)

● A new custom cab, with unobstructed forward and side visibility, instruments and controls grouped and positioned for easy access by the driver, and full insulation and all-weather ventilation has been announced by the White Truck Division of The White Motor Company. The unit, available in steel or aluminum, is optional equipment on the White 9000 and 4000 Series trucks and tractors.

The new cab is 72 in. wide at the rear, and has a door opening of nearly 36 in. Bumper to back of cab measurement is 90 in. Comfort factors for the driver include the contoured Western-type seat with separate and multiple adjustment settings, no-draft side windows opening to 135 degrees, and insulation against heat, cold, and noise built into roof and firewall, side and back panels, as well as the toe and floor boards. (360)

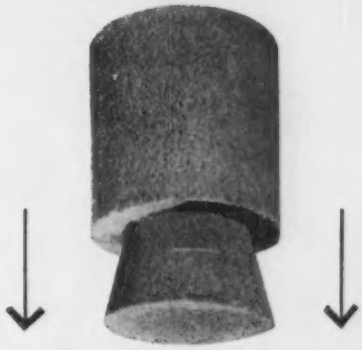
● To improve appearance and protect vacuum cleaning tools as well as accessories from loss or damage, the U. S. Hoffman Machinery Corp. is introducing a new cabinet for storing hose, tools, rods, etc., as illustrated.

The cabinet is 40 in. wide, 78 in. high, and 18 in. deep, and fabricated of #18 gauge welded and reinforced steel. A 12 in. by 40 in. shelf is a convenient storage space for spare parts. (361)

SEE AUSTIN FOR TIME-SAVING BLASTING PRODUCTS

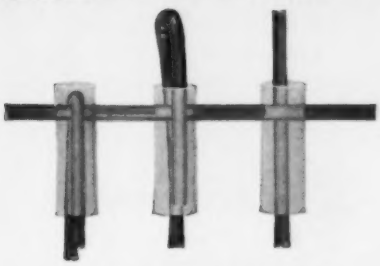
AUSTIN ACP PRIMERS

Six primers, each smaller than a man's fist, designed specially for use with fertilizer grade ammonium nitrates. Very insensitive to shock and abrasion. Three types possess rifle impact sensitivity of zero . . . may be more safely removed from holes that fail to detonate. Central fuse channel, cap well, other handy features.



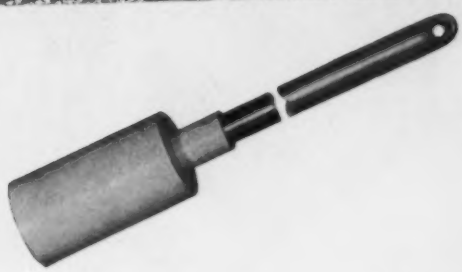
AUSTIN ATP TAMPING PLUGS

Seven cast cement plugs for tamping holes 4" to 10" in diameter. Plug is loaded cone first in hole behind the explosive. The base is tamped over the cone and seats itself solidly in the hole—tightly confining the charge. No additional stemming required.



AUSTIN FUSE CONNECTORS

Provide a quick, effective detonating fuse hook-up without tying knots. Simply thread fuse from shot hole through length of connector and press trunk line into grooved slots. Then return branch through end of connector over trunk line and pull tight.



AUSTIN ALUMINUM TAMPING POLES

Strong, lightweight, non-sparking. Weigh only a fraction as much as wood. Won't warp or splinter. Special hook and eye attachments assure quick connection of extra lengths. Models for all size holes.

AUSTIN PORTABLE EXPLOSIVES MAGAZINES

Three types for hauling explosives by light truck or tractor around job sites. Made of welded steel with wood sides and tops. Masonite floors. Easy to load and unload. Designed for rugged service. Approved by state mining authorities.

A-4718A

AUSTIN POWDER COMPANY

Cleveland 13, Ohio

Please send me information about

- ☐ ACP Primers
- ☐ ATP Plugs
- ☐ Fuse Connectors
- ☐ Portable Magazines
- ☐ Aluminum Tamping Poles

Name_____

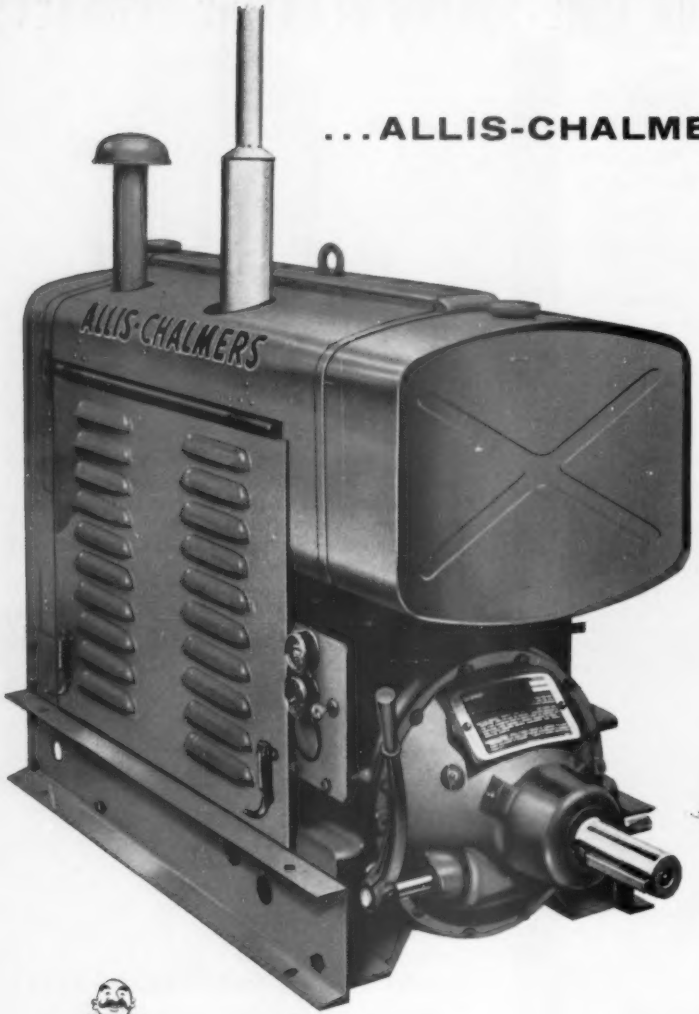
Company_____

Address_____

City_____ State_____

big power at low operating cost

...ALLIS-CHALMERS PEP* ENGINES



Rugged

Rugged because they are designed to take the year-after-year, sudden-overload, all-weather punishment of tough tractor service.

Thrifty

Thrifty because every bit of fuel goes to *work*. The POWER-CRATER engine burns the fuel completely . . . does not send wasted horsepower up the exhaust stack.

Compact

Compact and easily portable, these power units are mounted on their own base ready to install anywhere in a jiffy.

Powerful

Powerful. You have a choice of horsepowers from 17 to 67, but that's just half the story. These engines deliver high torque at normal working speeds.

Simple to Maintain

Simple to maintain . . . with such advantages as removable wet-type cylinder liners and parts and service right nearby.

Ask your Allis-Chalmers dealer to show you how to put new PEP in your powered equipment. Allis-Chalmers, Milwaukee 1, Wisconsin.

*Packages of Economical Power			
	G-138	G-149	G-226
Displacement, Cu In	138	149	226
Horsepower (gasoline)	38.8 @ 1800 rpm	45 @ 2000 rpm	67 @ 1800 rpm
Fuels: Gasoline, kerosene, distillate, and natural gas, plus LPG for the G-149 and G-226. Also diesel engines—in various models up to 516 hp.			

POWER-CRATER is an Allis-Chalmers trademark. BE-25

ALLIS-CHALMERS

***POWER* FOR A GROWING WORLD**

● Over-the-ear protection against high level noise is provided for workers exposed to both hearing and head hazards with #281 Sound Barrier, manufactured by the Willson Products Division, Ray-O-Vac Company.

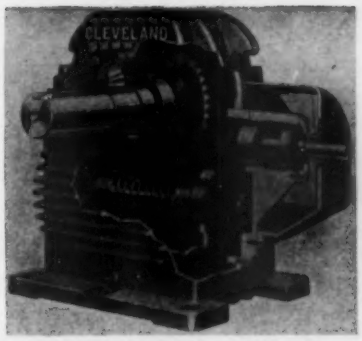
Sound Barriers attenuate (reduce) noise over a wide frequency range. The patented, fluid-filled vinyl cushions reportedly give soundtight fit, even with safety glasses.

The head-frame can be adjusted

for correct fit by a slide-lock without removing the unit from the wearer's head.

The component parts are removable for cleaning and for sterilizing.

The unit is available with earphones, earphones with microphone, plus attachments for connecting communication systems. (362)

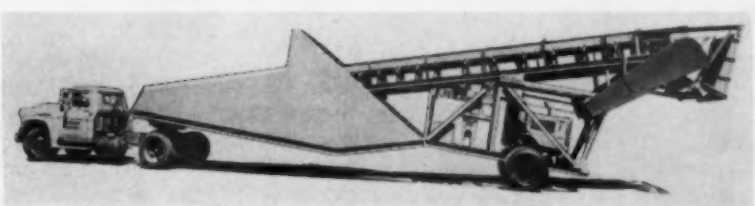


● Fan-cooled helical worm gear speed reducers are available in ratios extending approximately from 34:1 to 394:1 from the Cleveland Worm & Gear Division of Eaton Manufacturing Company.

The reducers come in seven sizes, ranging in size from 4-in. to 12-in. center distances. Ratings are from fractional to 58.5 horsepower.

The helical primary gears are cut from high hardness steel. In the secondary reduction the worms are machined from medium carbon steel that reportedly gives a high degree of hardness to below the root diameter while maintaining the advantage of a core of medium strength. The worm gears, for increased strength and resistance, are cut from bronze and are bolted or mechanically keyed to cast iron hubs.

In all sizes both gear reductions share a common oil bath. Shafts are supported by ball and tapered roller bearings sized for heavy radial and thrust load capacity. (363)



● The "Roughloader," a heavy duty conveyor loader designed for bulldozer push charging in shallow cuts, has been introduced by Koehring Company of California (Ko-Cal), a division of Koehring Company.

In field testing the 48-in. unit was clocked loading out 30 cu. yd. of material in 30 seconds. (Other belt conveyor widths available are 42 in. and 60 in.)

The charging end of the Roughloader has a low profile, making it ideal for shallow cuts. This end of the unit is strong enough to support both the dozer and the material it is dozing. Heavy duty troughing and impact carriers are spaced to handle the heaviest materials. Power is applied to both sides of the head roll, eliminating shaft and roll breakdown. (364)

POKER? Play to win!

How would you play this hand?

One chance in five to fill this flush, so be sure the pot is at least five times as big as the bet. If you haven't passed openers, raise. In general, a timid "calling" game is a losing game. Play percentages, but push them hard.

Here's a sure winner from FORD:

Latest addition to the world famous Fordson diesel line of tractors—the new Fordson Super Major. New disc brakes, differential lock, comfort seat and many other new features give a new peak in Fordson performance.

Still the same reliable engine, however—the dependable 42.6 drawbar H.P. engine which has earned a reputation for fuel economy unmatched by any other engine in its class.

Fordson Dexta Diesel tractor is better, too. Improved hydraulic system, transmission and styling make it a better buy than ever before. Get details from your Ford Tractor Dealer, or write:

Tractor and Implement Division
Ford Motor Company
Birmingham, Michigan

Ford
TRACTORS
EQUIPMENT

Enter 65 on card, page 177

● Model 25-B, reported to be a fully convertible crawler crane-excavator featuring synchronized operating control, has been introduced by Bucyrus-Erie Co.

As a crane the unit is rated to 30-ton capacity. As a hoe or shovel the machine can be equipped with 1- to 1¼-cu. yd. dippers. As a dragline-clamshell it handles buckets ranging from 1- to ¼-cu. yd.

The air control stand gives the operator synchronized control over the machine's operations. Graduated control valves actuate the main clutches and boom hoist. Other air-controlled movements are activated by poppet valves.

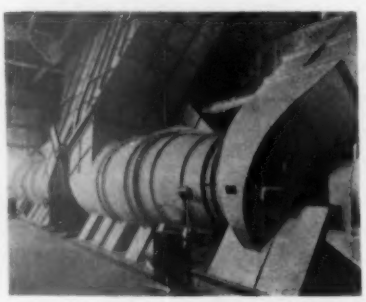
Crawler mountings are offered in a choice of three tread widths—26, 30, and 36 in. An independent boom hoist provides positive power control of the boom, both up and down, by individual air-controlled friction clutches. The standard power unit is direct drive diesel. (365)

● The WR 670 rotary portable air compressor, offered by Chapman Engineering Supply Corp., has an output of 630 cu. ft. per minute. It can reportedly be used for light or heavy rock drills, rammers, clay spades, etc.

The unit is powered by a Rolls-Royce diesel engine, with electric starting. The output is governed by a control gradually reducing the speed of the engine down to about 50 percent of full output. The pressure then increases to 100 lb./sq. in., and the suction is closed. At a predetermined figure the suction unloader valve automatically opens, and speed increases with demand. An automatic pressure switch is incorporated. (366)

● Variax, variable axial flow fans for use as induced, forced-draft, or cooling fans in cement plants and mining installations, are available in the U.S. for the first time from Novenco Inc.

The Danish designed and engineered unit reportedly attains higher than average rotational speeds with complete safety. Both the custom built and standard fans are controlled during operation by variation of the



blade angle, thus assuring constant speed and minimizing power used in regulation. Versatility is afforded through interchangeability of snap-out blades with a variety of fin structures. All operating parts are accessible for inspection and maintenance.

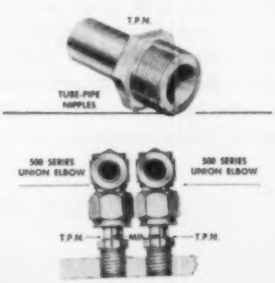
The fans are constructed in standard sizes for capacities from 50,000 to 1,100,000 cu. ft./min. Larger sizes produce pressures up to 25 in w.g. under normal temperature and pressure conditions. Variax fans operate to maximum temperatures of 400 deg. F. For operation to 650 deg. F. models of special alloys are also available.

The blades are cast of special alloys and provided with reinforced wearing edges. The fan hub is enclosed.

Both horizontal and vertical models are available for installation in restricted and difficult access areas. The short over-all length reduces by 50 percent, according to the manufacturer, the installation space usually required. (367)

● Difficult piping layout and maintenance problems reportedly can be solved by using the "O-ring seal" fitting in combination with tube-pipe nipples (TPN), both manufactured by The Lenz Company.

The tube-pipe nipples were designed to allow easy positioning in desired directions, including up and



down, when using elbows, tees, and crosses. Close quarters fitting problems are reportedly solved, and the use of costly and special fittings are eliminated.

In the illustration the outlets are too close to permit screwing male elbows into the ports but the tube-pipe nipple fitting with the O-ring seal union elbow permits installation with minimum space between the elbows. A tee or cross could be joined in the same way.

The nipple fittings are available in a range of sizes from ¼ in. o.d. to 2 in. o.d. and conform to approved JIC specifications. (368)

Enter 67 on card, page 177 →

NEW Crawlmaster drill and Gyro-Flo compressor

...most versatile and powerful combination available for 4" to 6½" blast holes

THE INGERSOLL-RAND CRAWLMASTER is a multi-purpose blast-hole rig with extra weight and power for the toughest drilling jobs. This rugged machine is mounted on dozer-type crawlers with enclosed gear drive from two 11½-hp air motors, and interchangeable drill units permit percussion, rotary or Downhole drilling of 4" to 6½" holes at any angle from vertical to horizontal. Features include hydraulic feed and retraction, remote controlled reverse rotation, 30" hydraulic leveling jacks and simple ejector-type dust collector.

Ample air power for all Drillmaster functions is provided by a 900-cfm Gyro-Flo rotary compressor—the last word in portable compressor economy and dependability. Simplicity of operation, freedom from maintenance, small size and light weight, air temperatures under 200°F, low oil consumption and closer regulation at all loads make Gyro-Flo the ideal running mate for the new Crawlmaster drill.

Ask your I-R distributor or engineer for complete information on the cost-saving Crawlmaster Gyro-Flo combination.

Ingersoll-Rand

67A14 11 Broadway, New York 4, N. Y.

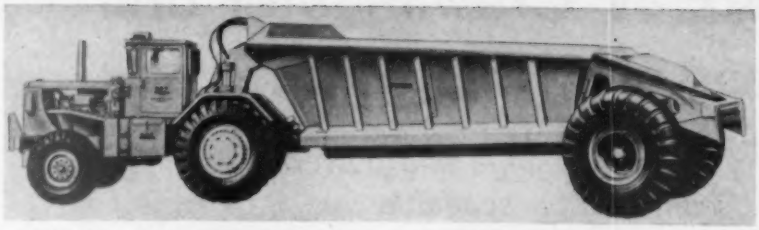
A CONSTANT STANDARD OF QUALITY IN EVERYTHING YOU NEED FOR DRILLING ROCK

● Six new high-capacity trailers have been introduced by Athey Products Corporation. A feature of the new units is increased payloads due to use of "T-1" steel construction.

The new models are as follows:

PR631 — teammate of the 420 hp. Caterpillar 631 2-wheel tractor, 40-ton capacity rear dump trailer, travels up to 31.2 m.p.h.

PR630 — campanion to 420 hp. Caterpillar 630 4-wheel tractor, 40 ton capacity rear dump, speeds over 41 m.p.h., low center of gravity.



PR619 — teams with Caterpillar 619 2-wheel tractor, 25-ton capacity, reportedly provides top haul speeds and extreme maneuverability.

PW630 — (illustrated) works with 420 hp. Caterpillar 630 4-wheel tractor, 32-cu. yd. bottom dump, 3-door dumping eliminates hang-up, spots loads.

PW631 — powered by 420 hp. Caterpillar 631 tractor, 30 cu yd. (struck) capacity, like PW630 this 2-axle bottom dump has 3-door dumping.

PH630 — matched to 420 hp. Caterpillar 630 4-wheel tractor, 60-ton—85-cu. yd. (heaped)—capacity, bottom dump, travels over 40 m.p.h. (369)

Plibrico research solves costly servicing problems

PLIBRICO "80" for extremely high temperatures
...2000-3300° F.
Excellent acid and abrasion resistance.
80% alumina; 14% silica.
Heat setting.
Available with air bond for greater strength.

SUPER AIR BOND for severe high temperatures
...500-2800° F. with low-temperature bond.
Good acid and abrasion resistance.
43½% alumina; 50% silica.
Air and heat setting.

New plastic refractories take MORE PUNISHMENT in dryers, kilns, hoods, furnaces

These new refractories are designed especially to lower maintenance costs in cement, lime and gypsum plants. They form a continuous joint-free lining, even around contours, which prevents penetration of dust and chemicals which cause early deterioration. And you save the cost of special shapes.

Castable & Plastic Refractories, Ramming Mixes...for Drying, Processing & Calcining Furnaces.

WRITE FOR FREE LABORATORY REPORT giving technical data. Ask your Plibrico Field Engineer how you can save time and money with his 3-in-1 service.

Plibrico REFRACTORIES

Serving the Furnaces of Industry 24 Hours a Day
PLIBRICO CO., 181[1] Kingsbury, Chicago 14 • Canadian Plant: New Toronto, Ont.
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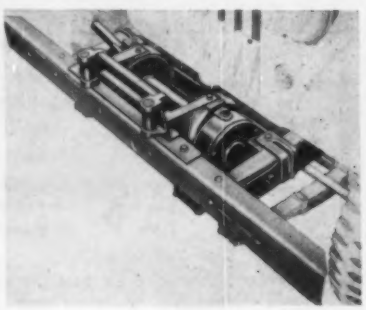
REFRACTORY PRODUCTS • ENGINEERING • CONSTRUCTION
Enter 68 on card, page 177



● A front end winch for the Universal Jeep has been developed by Braden Winch, division of Nautec Corporation. Three models, each with a safe working load of 8,000 lb., have been designed for use with six Jeep models.

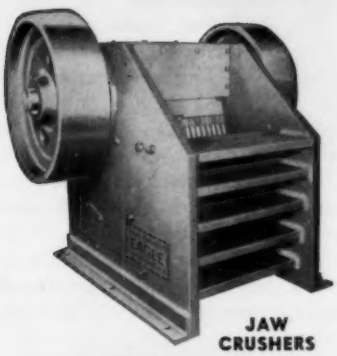
The three speeds forward and one speed reverse in the Jeep transmission are transferable for winch operation. The winch can be used in conjunction with or independent of Jeep's own motive power. (370)

● A rubber expansion joint that provides the same flexibility but 60 percent more capacity for withstanding high working pressures than standard joints has been introduced by United States Rubber Co.

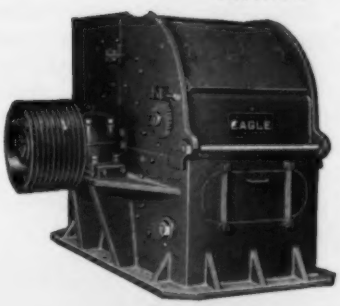
The inner construction of the AMR (anti-migration rubber) ex-

PRODUCE MORE STONE AND GRAVEL WITH MOBILE

Eagle's new 6600 series portable jaw crusher—featuring low loading hopper —within easy reach of all makes of front end loaders. Variations in basic portable design provide for cage mills, hammermills and roll crushers.



JAW CRUSHERS



HAMMER-MILLS

CAGE MILLS

Eagle Crushers bear the characteristic marks of the experienced manufacturer—simple design, durable construction, ease of servicing. Eagle originated the one-piece, electrically welded frame—has pioneered in the field of portable, compact, crusher plants like the one above.

The range of models and sizes in the Eagle line meet most every need from primary crushing to super-fines. Expert engineering counsel available to help you with technical problems. Write—describing your needs. Representative will call if you desire.

EAGLE
JAW AND ROLL CRUSHERS, PORTABLE PLANTS, CAGE AND HAMMERMILLS, CONVEYORS, LOADERS
CRUSHER CO., Inc. GALION OHIO-U.S.A.

TRUCK-MOUNTED LOADER

Performing a TOP JOB...
The MIKRO-PULSAIRE
DUST COLLECTOR

Installed at the Hawaiian Cement Company's new plant at Barber's Point, Oahu, you'll find a total of nineteen MIKRO-PULSAIRE Dust Collectors, four of which are pictured above.

Because it has no moving parts . . . internally or in the gas stream . . . the MIKRO-PULSAIRE has proved ideally suited to handling highly abrasive materials such as cement. Other features to be considered are its record of 99.9% *plus* recovery, and high air-to-cloth filter ratio. Our Hawaiian installation provides a total filtering capacity of 329,928 cfm. Whatever your requirements, the MIKRO-PULSAIRE can deliver a top job for you, economically and with maximum dependability.

MIKRO-Products
PULVERIZING MACHINERY COMPANY
3 Chatham Rd., Summit, N. J.
A Division of American-Marietta Company

REPRESENTED THROUGHOUT THE WORLD IN SALES, SERVICE AND MANUFACTURING FACILITIES.

Enter 70 on card, page 177

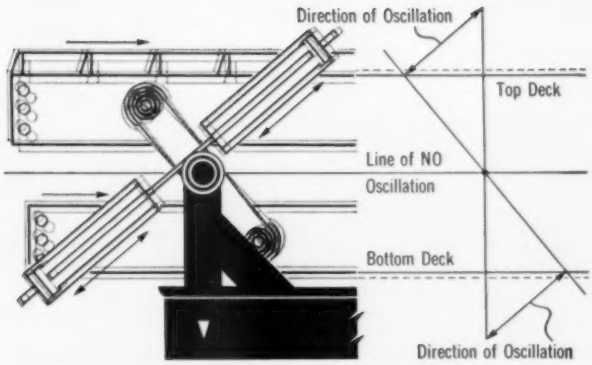
pansion joint enables the metal reenforcing rings to remain stable under pressure. It has been designed to enable piping to withstand flow surges and high pressure requirements. The AMR joint handles corrosive materials and withstands a wide range of temperatures. It is available in a variety of constructions to meet the requirements of almost any application. (371)

● Fifty-watt power output 2-way mobile radio units for use in the 25 to 54 megacycle band are available from the Mobile Communications Department, Allen B. Du Mont Laboratories, Division of Fairchild Camera and Instrument Corp. The unit, Type 125-A, includes the complete transmitter/receiver, transistorized power supply, and necessary antenna.

A 25-watt version, Type 126-A, for the same frequencies includes the antenna, and all installation, parts, and accessories.

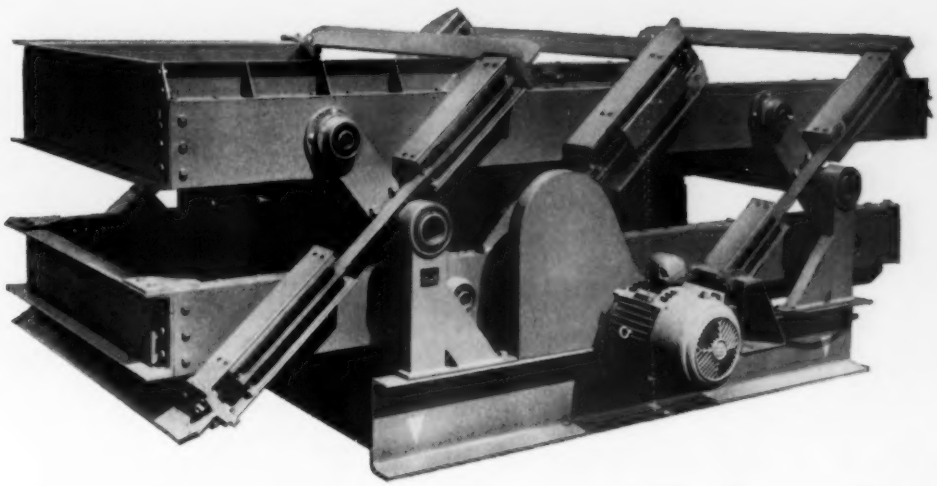
The Du Mont Transicom line of 2-way mobile radio equipment is available in four versions to meet the power and range requirements of the user in both the 25 to 54 megacycle band and in the 144 to 174 megacycle band. All four types are constructed for under-the-dash mounting, and contain 3 to 5 in. integrated speaker with audio directed to the driver's ear. Handcrafted wiring is featured throughout.

Transistors, other semi-conductors, and vacuum tubes are employed to achieve compact design without printed circuitry. Battery drain-saving circuits are used. (372)



This illustrates the point-of-NO-oscillation suspension: The screen decks are supported exactly in their center of oscillation—a point of NO oscillation—and therefore transmit no dynamic power to the frame. The screens vibrate vigorously, but the frame stays absolutely still.

THIS HORIZONTAL SCREEN OUTPERFORMS ANY OTHER



This is a picture of true balanced-mass design: Both decks do effective work. There is no dead weight counter balance. There are no dampeners on the frame.

No vibratory screen, regardless of type or make, classifies as accurately and economically as COMCO's Binder System horizontal screen. There are two solid reasons for this.

- In COMCO's exclusive *true balanced-mass* design, both masses do effective work. THERE IS NO DEAD WEIGHT. All other so-called balanced-mass screens vibrate the screen decks against a counter-balance mass that does no work, yet weighs as much or more than the screen decks.
- In COMCO's exclusive *point-of-NO-oscillation* suspension, no dynamic power is transmitted to the frame or supporting structure, requiring no dampeners. The entire screen vibrates vigorously and evenly, with a live action that is not deadened by dampeners, yet THE FRAME STAYS ABSOLUTELY STILL.

Besides these two exclusive features, COMCO screens incorporate other sound principles of modern screen design. *An example:* metal-bonded rubber Shear Block Springs cut power costs to the bone. Once the screen decks are in motion, these springs keep them oscillating, alternately storing and releasing energy in a natural rhythm that requires almost no additional power from the motor. For all the facts, write for our new Bulletin B-100.

COMCO

CORPORATION 5421 Lancaster Ave.
Philadelphia 31, Pennsylvania

Rheax System Classification and Dewatering Plants
Binder System Vibratory Screens and Conveyors

FOOD FOR THOUGHT

. . . IN SOLID ROCK!

Don't try to eat this "food"! The steak is petrified wood, potatoes are quartz, cauliflower is howlite, rolls are sandstone concretions. The prunes are obsidian nodules, the avocado is agate, and the cheesecake is satin spar on onyx.

This dinner of rocks is part of a collection of Mrs. Erna Clark, Redlands, California, who, like any aggregate producer, has hunted for suitable rock all over the country. The difference between Mrs. Clark's hobby and your business is that *you* need crushing, mixing or paving equipment that makes *your* rock collection fatten your bankroll!

Think about your equipment . . . your competition . . .

YOUR PROFIT'S AT STEAK!

Whether you spell it steak or stake, profit is the meat of your business. Getting on the gravy train depends on equipment that can handle the job economically — on what your competition is doing — and on YOU.

Years ago a customer in Texas wrote, "I wish you'd quit selling Commanders to contractors in my neighborhood. The only real competition I have around here is other Cedarapids plants."

Chew that over awhile. Then digest this thought . . .

Throughout the years, Cedarapids owners have learned by experience that Cedarapids equipment out-produces and out-economizes any other. Know why? Because Cedarapids has always been first in developing and introducing equipment that meets increasingly difficult requirements with increased production and no beefs about maintenance.

When you own Cedarapids equipment you are three to five years ahead of your competition in low-cost production. And you are the one who keeps eating high on the hog with the greatest profit.

THAT'S FOOD FOR THOUGHT!

Cedarapids

Built by IOWA

Portable Aggregate Plants and tandem crusher plant design were born at Cedarapids, and put big-capacity crushing on wheels for mobility to move with the job and bring profitable production to the job site. With this lead in the race to give contractors ever better, more productive equipment, Iowa Manufacturing Co. researched and engineered, developed and improved crushing plant design to its present unequaled Cedarapids standard of efficiency and economy.

Cedarapids Twin Jaw Crushers have been giving contractors 40% to 100% greater primary crushing capacity for the past seventeen years . . . years of extra profits for Twin Jaw owners! This time-proved unit is stepping up output in Super Commander Plants (above) and other Cedarapids models. Now, the two-movable-jaw principle is no longer a Cedarapids exclusive. Other equipment manufacturers are following our lead, while Cedarapids engineers are working on revolutionary products for the future.

Cedarapids Horizontal Vibrating Screens have been first choice in the industry for 25 years, because horizontal screen design gives 12½% more effective screening area, 30% higher capacity, and much greater accuracy in grading specification sizes. After profit-conscious contractors began to expect the advantages of better screen performance in portable as well as stationary plants, which only horizontal screens could give, other equipment manufacturers again followed our lead.

Bituminous Mixing Plant all-automatic design with true weight proportioning is the result of experience gained since 1946 when Cedarapids first equipped batch-type plants with semi-automatic controls for faster, better bituminous mixing. Cedarapids was also first to cut between-job delays with a 100% portable and self-erecting batch-type plant. Though other manufacturers have followed, Cedarapids still leads in the many other profit-proved batching, mixing and drying advantages that assure extra batches per hour for extra earnings per year.

Cedarapids Bituminous Pavers brought another profit-first to paving contractors. The Cedarapids Paver is the only such machine that lays inspector-accepted mat at 102 fpm; the only paver with a high frequency vibrating screed; the only paver so automatic it almost operates itself. And maintenance costs are exceptionally low. When you own a Cedarapids Paver, your only competiton is another Cedarapids owner . . . and you'll have this profitable advantage until Cedarapids patents run out and other manufacturers can follow our lead.

INS 19

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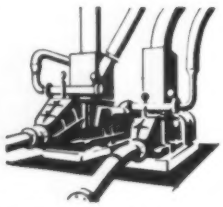
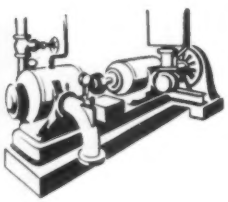
IOWA MANUFACTURING COMPANY • Cedar Rapids, Iowa

FULLER EQUIPMENT

for the process industries

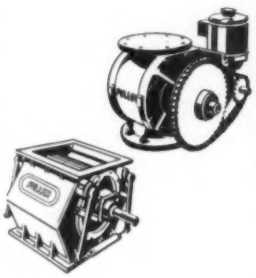


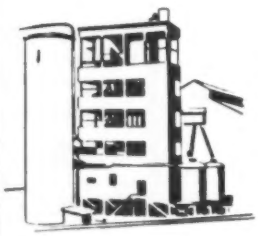
Pneumatic Materials Handling Systems. Widely specified throughout the process industries, Fuller's range of equipment offers best single source for solving problems in moving dry bulk materials pneumatically. Fuller-Kinyon Pumping Systems, Airveyor® Pressure and Vacuum Conveying Systems, and F-H Airslide® Fluidizing Conveyors are completely sealed to prevent both contamination of the product and any leakage of dust, etc., into the surrounding area. They are used to move dry, granular and pulverized materials to and from cars, ships, trailers, storage and processing points.



Fuller Rotary Compressors and Vacuum Pumps are vibration-free, can be installed anywhere, even on balconies. Fewer moving parts mean minimum maintenance. Compressors and Vacuum Pumps handle air and gases from 30 to 3300 cfm at pressures to 125 lb. gage. Vacuums to 29.95 in. (referred to 30-in. barometer).

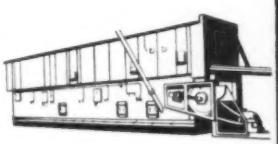
Fuller Vane-type and Roll Feeders . . . for volumetrically controlled feeding of a wide range of dry pulverized or granular materials. Also Fuller Rotary Valves . . . used under silo deck slabs and bins to permit the free flow of pulverized materials which tend to arch, such as lime and cement raw materials.





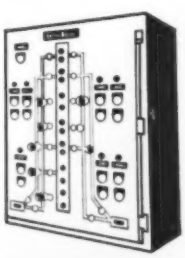
Fuller Preheaters, Humboldt Suspension Type . . . for preheating dry, pulverized Portland cement raw materials with rotary kiln waste gases.

Fuller Horizontal and Inclined Grate Coolers are compact, easily installed for fast, efficient cooling of materials such as nodulized phosphate rock, pebble lime, ores, dolomite, iron nodules and Portland cement clinker from 2800°F. or higher to any desired point within a reasonable range of atmospheric temperature.



Fuller-Material-Level Indicators signal audibly and visibly when materials reach a predetermined high or low level. Controls conveyor motors, valve circuits, etc.

Fuller Control Panels permit automatic, remote, one-man control of multiple operations. Easily-read panel permits visualizing flow of material to storage or from process bins.



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Washington Newsletter

(*Concluded from page 11*)

matic is the virtual elimination of expense account living.

As a matter of fact, the Internal Revenue Service has for many years been diligently eliminating most of the abuses in this area. In this effort the principal impediment has not been the law, or even the taxpayer, but rather the courts, which have frequently allowed ostensibly frivolous expenditures or those which bore the heavy imprint of personal rather than business spending.

Equally unpopular is the proposed witholding tax on dividend and interest income. Underlying this proposal is the strong belief that much of such income is not declared and, therefore, escapes taxation. This is regarded as an unwarranted and unproved accusation.

In Washington right now it is thought that these tax proposals will not only have rough going in Congress, but that it is quite unlikely they will even get serious consideration in this session. The greatest likelihood is that they will die in committee. Even if this happens, they will have served the Administration's purpose, which is to make a record for proposals to encourage more rapid economic growth even, if those proposals are less than practicable or feasible.

Labor Developments

(*Concluded from page 13*)

son to believe that in an industry covered by this act the competition of foreign producers in American markets or in markets abroad, or both, has resulted in (or is likely to result in) increased unemployment in the United States.

If he determines that such increased unemployment has actually resulted or is likely to result from such competition, he is required to make a full and complete report of his findings and determinations to the President or to Congress. He is also required to include in such a report information on the increased employment resulting from additional exports in any industry under this act as he may determine to be pertinent.

Enter 75-A on card, page 177

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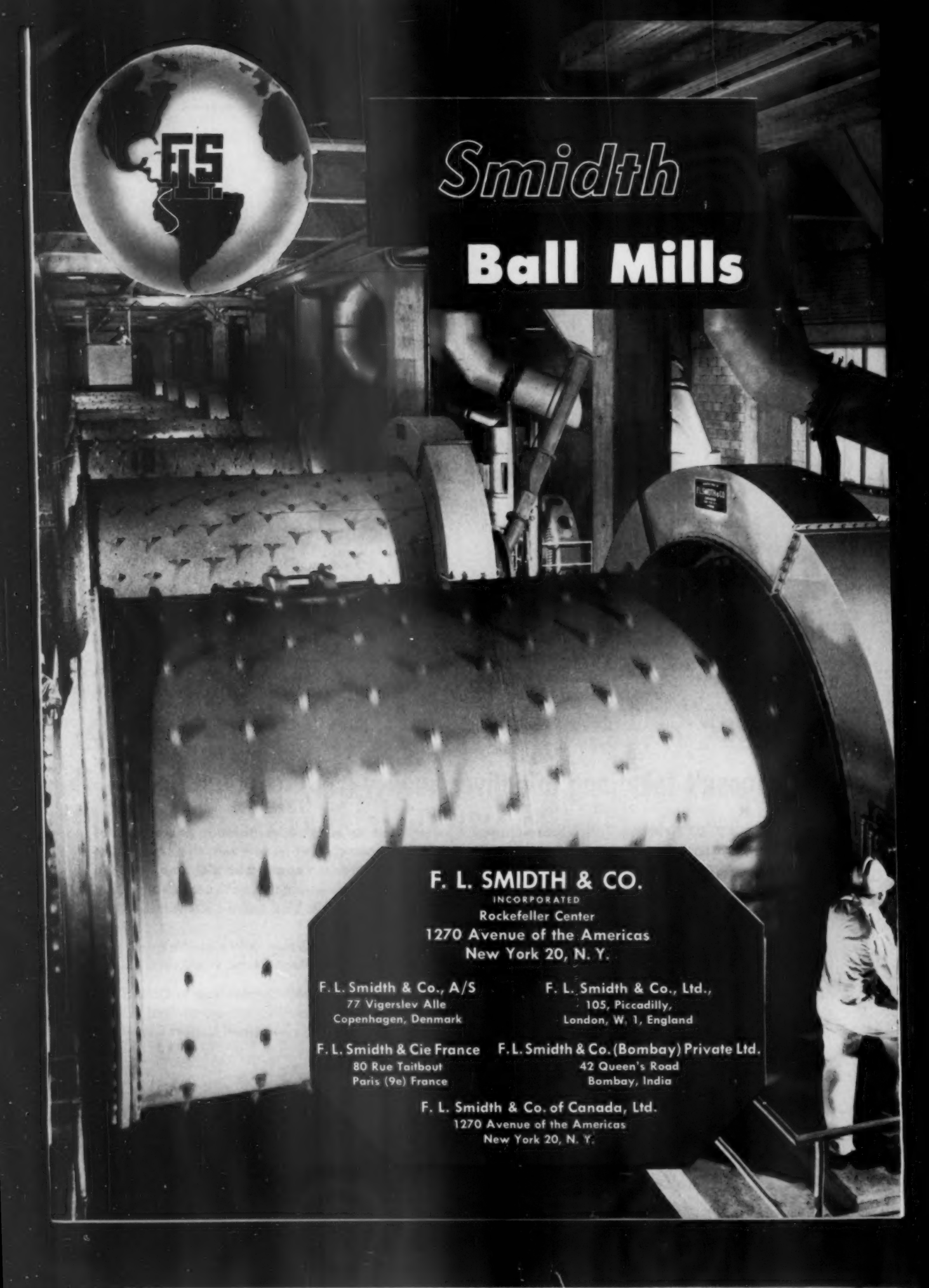
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The Editor's Page

Shortage of Engineers vs. Surplus of Labor

JUDGING from numerous and conflicting reports, the rapid technological progress in this country has created a confusing situation. This progress has caused a serious shortage of engineers, scientists, and technicians. At the same time automation, one of the results of this progress, has eliminated many jobs, and those involved are having difficulty in finding other work within their capabilities.

Also at the same time, industry is having difficulty in filling the many new jobs created by these technological advances. The problem is further complicated by the migration of unskilled farm workers into industrial centers. And unless something is done about it, this situation can only get worse.

There is a growing feeling that it is important to our national security to help other people of the free world to help themselves. According to one authority, the construction of roads and bridges, water supply and utility systems, and schools and hospitals in the smaller nations is perhaps their strongest bulwark against the inroads of international Communist aggression. This will require the export of more and more of our engineering and construction know-how.

THE continuing shortage of engineers is a statistical fact. Not only are fewer engineers being graduated, but freshman engineering enrollments are steadily decreasing. According to the Engineers Joint Council, the decline is attributed to: (1) the increased interest of qualified students in other fields of science, especially since "science and the space age" has been glamorized in public opinion; (2) concern over the rigors and demands of engineering education; and (3) a decrease in applications from students, who lack a genuine interest and motivation for engineering.

Industry must share the blame for this shortage. A few years ago, when large government contracts were cancelled, companies which had been bidding against each other for engineers fired them in wholesale quantities. This "panic" action caused many potential engineers to shy away from this profession. Industry can do much to help this situation by making better use of the engineering talent that it has; by establishing better means of communicating to young people facts about engineering, its importance and its rewards; by creating scholarships; and by giving financial support to colleges.

A COMPANION problem is the growing need for "practical" engineers, not graduates, who can handle much of the work on which more highly trained men are now being wasted. Only about 20 percent of high school graduating classes make the grades which are required for graduate study, according to a recent report of the A.S.C.E. There is strong sentiment in favor of special short engineering courses with lower entrance requirements, which would develop this additional supply of engineering talent.

The unemployment problem created by automation can only get worse as our technological progress continues at an increasing rate. The only possible solution is to retrain as many as possible of these displaced workers to different, and in many cases, better jobs. According to Melvin H. Baker, chairman of the National Gypsum Company, industry and labor both have grave responsibilities in this field. The "crisis" presented by automation, he believes, is not so much one of employment as it is one of education.

Walter E. Trauffer

Quality Control Parallels

• Northwestern Gravel realizes efficiency, capacity, product objectives with new 500-t.p.h. plant

WHEN a truly progressive aggregates producer faces steadily growing market potential with inadequate production capacity, he expands his operations—and matches the expansion with corresponding emphasis on product quality. Northwestern Gravel Company, Inc., Savage, Minn., provides an outstanding example of those logically matched objectives with a new, highly efficient facility near Minneapolis.

By BUREN C. HEROD

Founded only five years ago by its president, Ray Skelton, Northwestern has grown as impressively as construction material demand in the metropolitan area it serves. The first aggregate plant built by Mr. Skelton, who had been an excavating contractor for several years, is a medium-sized operation at Savage. Here both crushed stone and sand and gravel are processed, with a combined capacity of about 150 t.p.h.

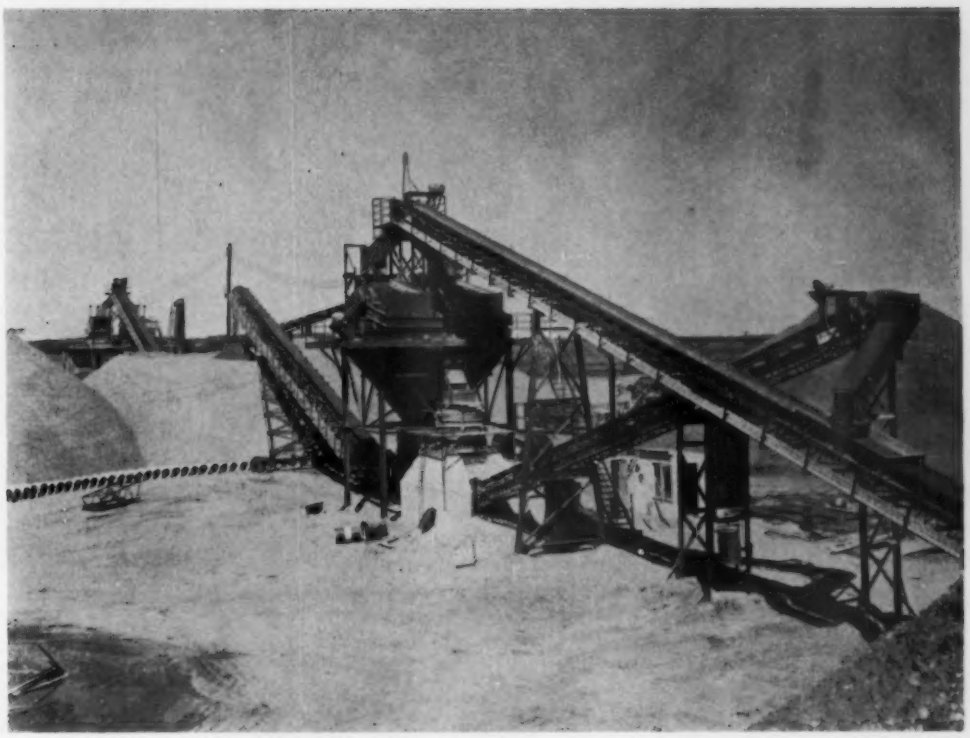
The new plant, handling sand and gravel exclusively, has tripled that capacity in the washing phase alone, and handles approximately 700 t.p.h. in the primary phase. It is located on a tract about 4 miles south of its older sister plant.

Knowing that capacity alone would not keep an operation in a strong competitive position, management stressed the factor of product quality from the very first planning steps directed toward building a larger facility. The objective was uncomplicated — equipment and a flow system that would deliver carefully processed individual fractions that would readily satisfy management's insistence on quality production of premium products, singly or as blends.

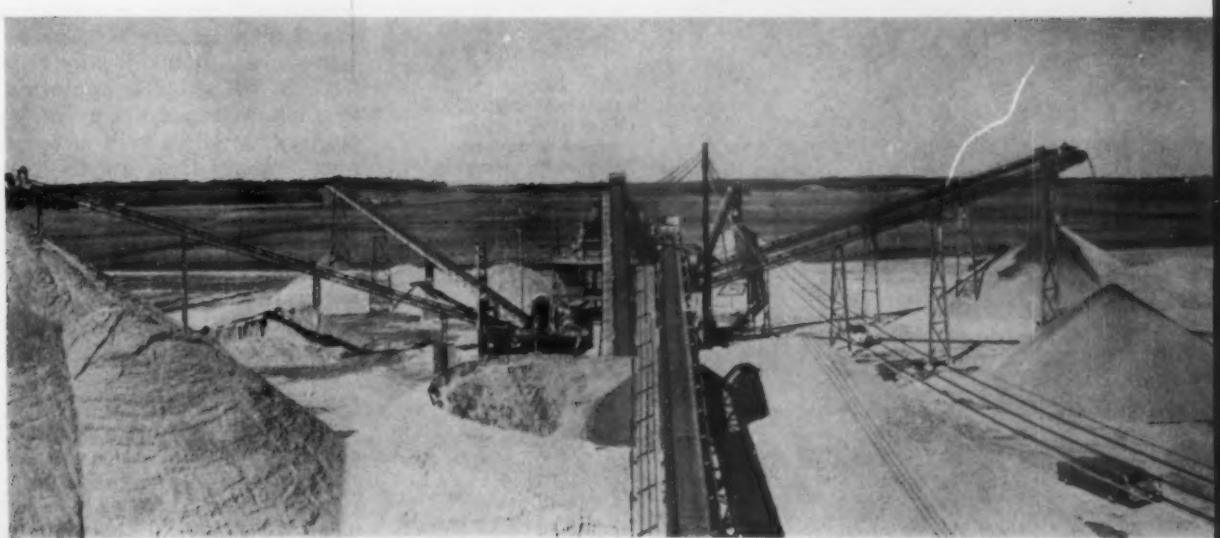
As a consequence, output can meet any specifications in the aggregate line for customers in the ready-mix and bituminous concrete markets. These plus base course materials comprise the bulk of Northwestern's sales. Some crushed stone is also sold (from the older

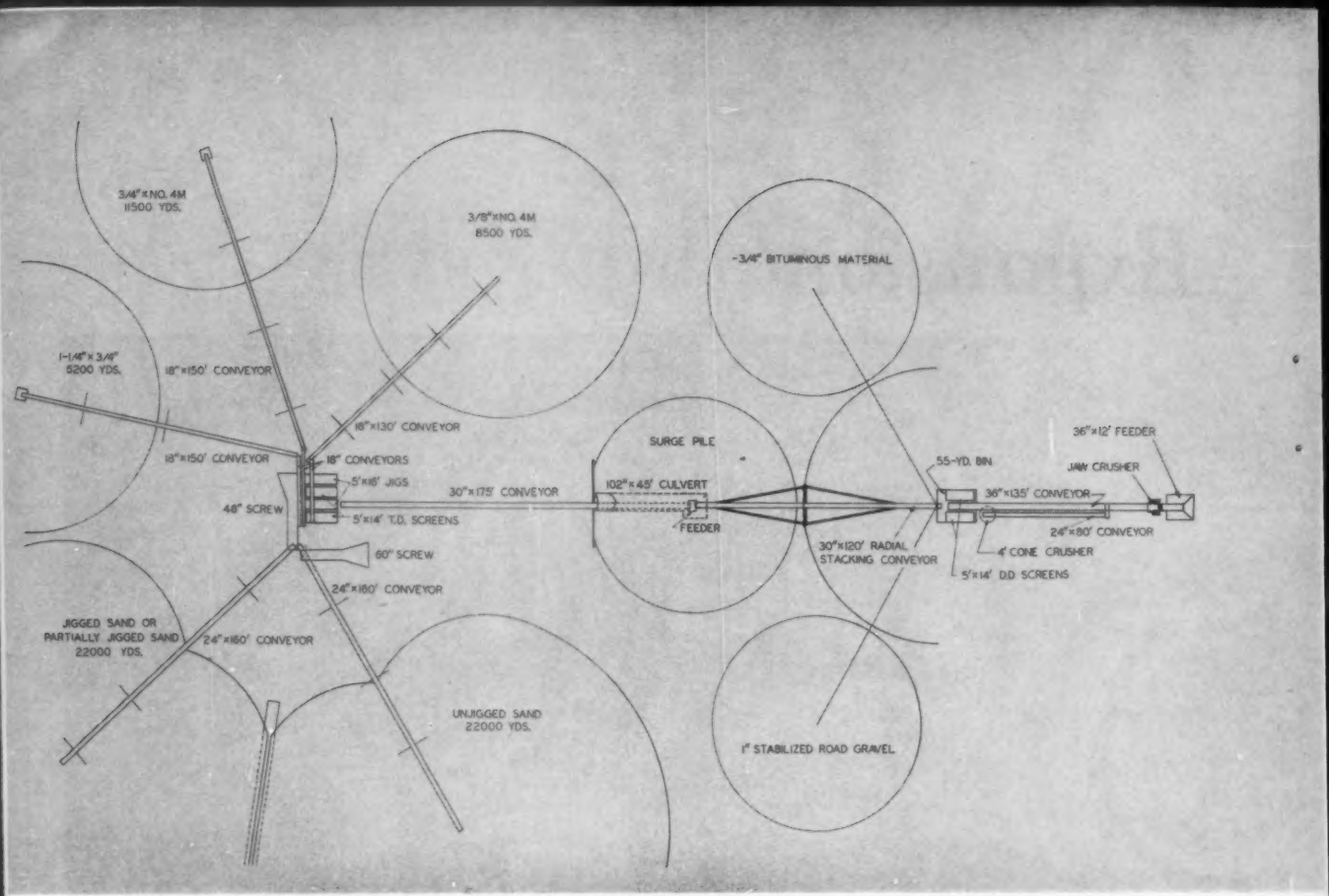
Left:
A VIEW OF THE PIT OPERATIONS from the primary plant shortly after the area was opened. The deposit has an excellent gravel/sand ratio; and, if desired, selective excavation can be made to meet certain customer specifications right in the pit.

Expansion



The PRIMARY PHASE (above) and the SECONDARY PHASE (below) of Northwestern Gravel's new operation near Savage, Minn. The secondary (washing) plant alone has tripled the capacity of the firm's entire original operation, which is only five years old. The two phases seen here are completely independent, the secondary being fed from a surge created by the primary.





● A PLAN LAYOUT of the over-all operation of Northwestern Gravel's Savage plant, with the primary phase at the right, and the secondary at the left.

INITIAL REDUCTION is made through a 3-in. setting in the primary jaw crusher.

operation) for driveway and similar uses.

Increasing vigor in the above markets sparked initial planning by Northwestern's officers for expanded operations. Since physical conditions did not support the feasibility of building a large new plant at the original operating site, a search was started for a location in which reserves would justify high-capacity facilities, and would be convenient to construction anywhere in the metropolitan Minneapolis area. A tract fulfilling those requirements was located only a few miles south of Savage, and a basic plan for the new plant was drawn up.

Detailed engineering of the basic plan was handled by D. R. Conkey and Associates, and Pioneer Engineering. Construction was started in April, last year, and by August 1 the new plant was in full operation.

Its design comprehends the minimum of material handling, remote control of processing stages in interlocked sequences from two control points, separation of primary and

secondary phases, a high degree of automation and consequent high tons/man-hour ratio, and beneficiation equipment to ensure peak quality control.

The bulk of the material-handling and primary processing units were supplied by Pioneer, including the primary jaw crusher, all conveyors, and four screens. The washing plant also includes two Wemco Sand Prep units and two Wemco jigs. There is a Simplicity vibrating grizzly feeder at the crushing plant feed hopper, and a Symons cone crusher is used on secondary reduction. Conveyors are equipped throughout with Boston Woven Hose & Rubber Silver King belts, and all equipment drive is furnished by Fairbanks-Morse motors.

In the tract acquired for the new operation, tests indicated the presence of an excellent deposit under shallow overburden with well distributed material having a good gravel/sand ratio. The top size averages not more than 6 in., and it is actually possible to excavate selectively and meet certain customer specifications right in the pit.

Currently, excavation is done with a Lima dragline fitted with a 1½-cu. yd. perforated Hendrix bucket, and a 1¼-cu. yd. Bucyrus-Erie excavator. Pit-run material is hauled to the plant feed hopper in Mack trucks with 19-ton capacity bodies.

As received in the 21-cu. yd. dump hopper, the material is transferred *via* a 3- by 12-ft. vibrating grizzly feeder to the 60-hp. 1536 primary jaw crusher, which is set for reduction to 3 in. Crusher discharge joins the grizzly throughs on a 36-in. belt for transport to the crushing plant screens.

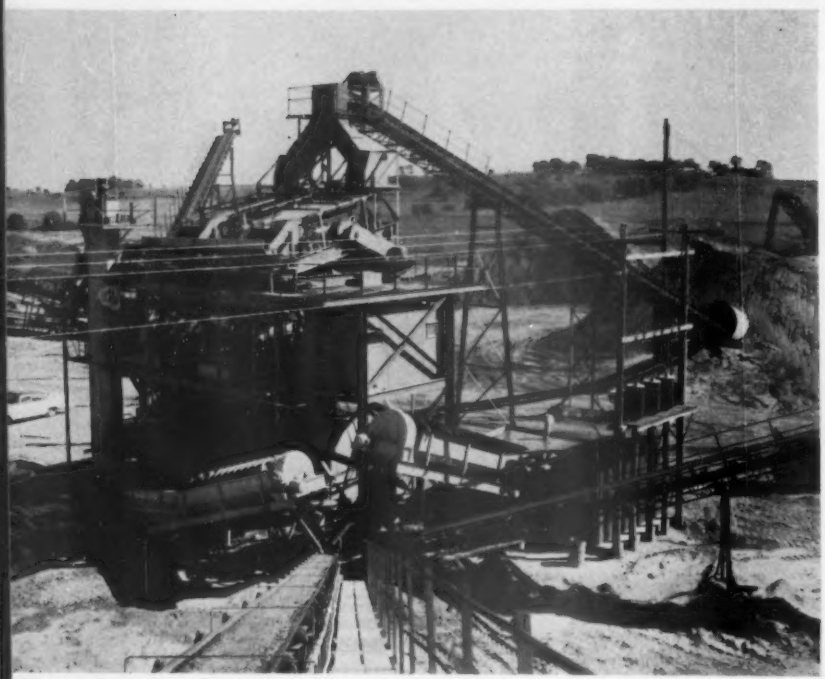
The latter, both 5- by 14-ft. double-deck units, are mounted above a 55-cu. yd. steel bin. Both screens make separations on 1½-in. top and ¾-in. bottom decks. The large fraction is chuted to the 150-hp. 4-ft. standard secondary cone crusher, and products of secondary reduction are received on a 24-in. belt that discharges to the screen feed conveyor in closing the circuit. Secondary reduction is through a 1½-in. setting.

Alternate flow is provided for the fraction retained on the bottom decks of the primary screens. It may

PRIMARY SCREENING is done on a pair of double-deck units mounted on this bin. At the right is the secondary cone crusher, operating in closed circuit with the screens, and at the left is the tail section of the radial stacker.

Above:
THE SURGE PILE (at the center) is created by the stacker from the primary plant (background). To the left and right are stockpiles of bituminous and stabilized materials, respectively, placed by the radial stacker.

Right:
FLOW to the secondary phase from the surge is initiated on this feeder in the reclaiming tunnel.



THE WASHING (SECONDARY) PLANT has three distinct processing stages. At the top are the triple-deck washing screens; immediately below is the section occupied by the jigging equipment; and at ground level are the two screws.

be chuted to the crusher for increased production of finer sizes, or dropped into a compartment of the underlying bin. Screen throughs drop directly to the bin.

The 30-in. by 120-ft. stacking conveyor that completes the material-handling system of the primary plant is a radial unit, and may transfer material from the screen bin to any of five stockpiles. In providing feed for the washing plant, the stacker discharges 1½ x 0 material onto a surge pile maintained at about 5,000 cu. yd.

During production of a particular material by the crushing plant, the stacker may be positioned to discharge onto lateral stockpiles, one of 1-in. stabilized road gravel, and the others of minus ¾-in. bituminous materials. Anything being made in the primary plant may also be simultaneously loaded into trucks through the gate under the screen bin. Control for all equipment in the fully interlocked primary plant phase is housed in a room at the base of the screen structure.

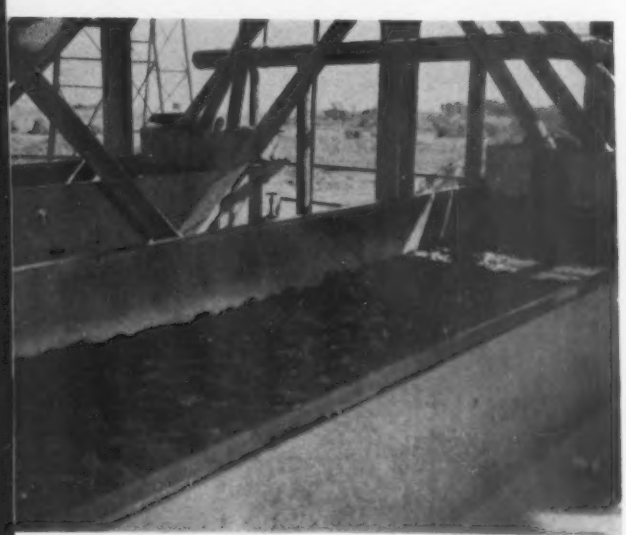
The washing plant surge pile is established over a 45-ft. reclaiming tunnel formed of 102-in. diameter prestressed concrete culvert. This tunnel houses a 30G reciprocating plate feeder that initiates material flow through the completely independent washing plant stage.

Feed reclaimed from the surge is placed on a 30-in. by 175-ft. conveyor and carried to the top of the steel washing plant structure. Here it is split to a pair of 5- by 14-ft. triple-deck washing screens. These units are similarly fitted with ¾- and ⅜-in. opening top and bottom decks, and 4M cloth on the bottom decks.

The top-deck retained fraction from both screens is chuted to a short 18-in. belt, which in turn discharges onto an 18-in. by 150-ft. stockpiling conveyor. This product leaves the conveyor through a stone ladder for placement on its pile. A similar system transfers the middle-deck fraction from both screens to a stockpile of approximately 11,000 cu. yd. of pea rock product. Flow of material from the bottom decks is somewhat different for the two screens.

From one screen the entire bottom-deck retained product is placed on an 18-in. by 130-ft. conveyor and carried to an 8,500-cu. yd. stockpile of buckshot. The throughs from the same deck flow to a 60-in. Sand Prep screw. On the companion screen, the bottom deck throughs also flow to the 60-in. screw. However, half of the 4M deck is blocked out—thus the ⅜-in. material and half of the 4M fraction can flow together to a following pair of 4- by 14-ft. jigs.

The jigged material is delivered to a 4- by 8-ft. single-deck rinsing screen fitted with 4M screencloth. Retained 4M is chuted to a bucket elevator that places it on the



JIGS. As necessary, any amount of the ⅜x0 fraction (which contains the objectionable material when any is present) is fed from a washing screen to these jigs, to assure consistent quality of finished products.

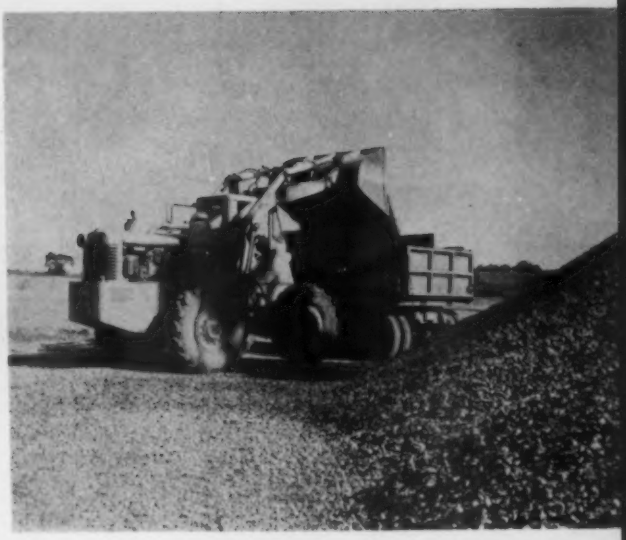
buckshot stockpiling conveyor, and throughs are flumed to a 48-in. Sand Prep screw.

About three-fourths of the sand in the flow through the washing plant is finally processed through the 60-in. screw noted above. This unit discharges sand to a 24-in. by 160-ft. stockpiling conveyor from which the product is placed on a stockpile of unjigged sand. A D6 Cat 'dozer is used to distribute sand from the discharge area, so that the pile will accommodate about 22,000 cu. yd. of material.

Jigged sand processed through the smaller screw is placed on another 24-in. by 160-ft. stockpiling conveyor, and is discharged onto a separate 22,000-cu. yd. pile. A part of the sand from the larger screw may also be placed on this conveyor, so that the stockpile created is a combination of jigged and unjigged materials.

When objectionable material is found in the plant feed, it is comprised entirely of shale, and it falls completely in the ⅜ x 0 range. Thus the washing plant flow was designed to provide maximum control of each individual fraction in the system and permit jigging, when desired, of any quantity of the above product range to bring it well within specifications.

Water for the washing plant is supplied at 2,000 g.p.m. by a 150-hp. F-M Pomona pump on a deep well. Control for the entire secondary phase, from surgepile feeder to stockpiling conveyors, is housed in a booth on the washing plant.



LOADING. With the exception of the material in the bin below the primary screens, all products are loaded from stockpiles, as seen here.

With the exception of the bin under the primary screens from which trucks may be loaded directly, all loading is done from stockpiles by two Model 250 Pettibone Mulliken Speedall loaders. From plant feed hopper to stockpiles of finished material the entire flow requires the attention of only two men—one for the crushing plant and one for the washing plant. Even taking into consideration the dragline operator, two drivers, the two plant men, and loaders as necessary, the over-all operation has an exceptional 100 tons/man-hour ratio.

In addition to Mr. Skelton, president, officials of the progressive young firm include L. M. Mertens, secretary, and Dick Bury, sales engineer.

N.Y. Wollastonite Deposit Available for Development

Adirondack Development Corporation, Keeseville, N. Y., let contracts early last year to Joy Manufacturing Company, Michigan City, Ind., to conduct an exploratory drilling program at Lewis, N. Y., for the purpose of establishing the area and quality of a wollastonite deposit.

Twenty-two holes were drilled, and the material was cored in 20 holes under an average overburden of 18 ft. Estimates were made that the four blocks of drill-indicated ore total 4,689,000 tons, and average 59 percent wollastonite. (The material possesses unusual brightness or whiteness, and can be substituted for both talc and asbestos.)

Subject to the approval of stockholders, Adirondack Development reportedly will consider selling its interest in the Lewis deposit outright, or join with a major concern and share development costs.

Consolidated Sand & Gravel Buys Malton, Ont., Plant

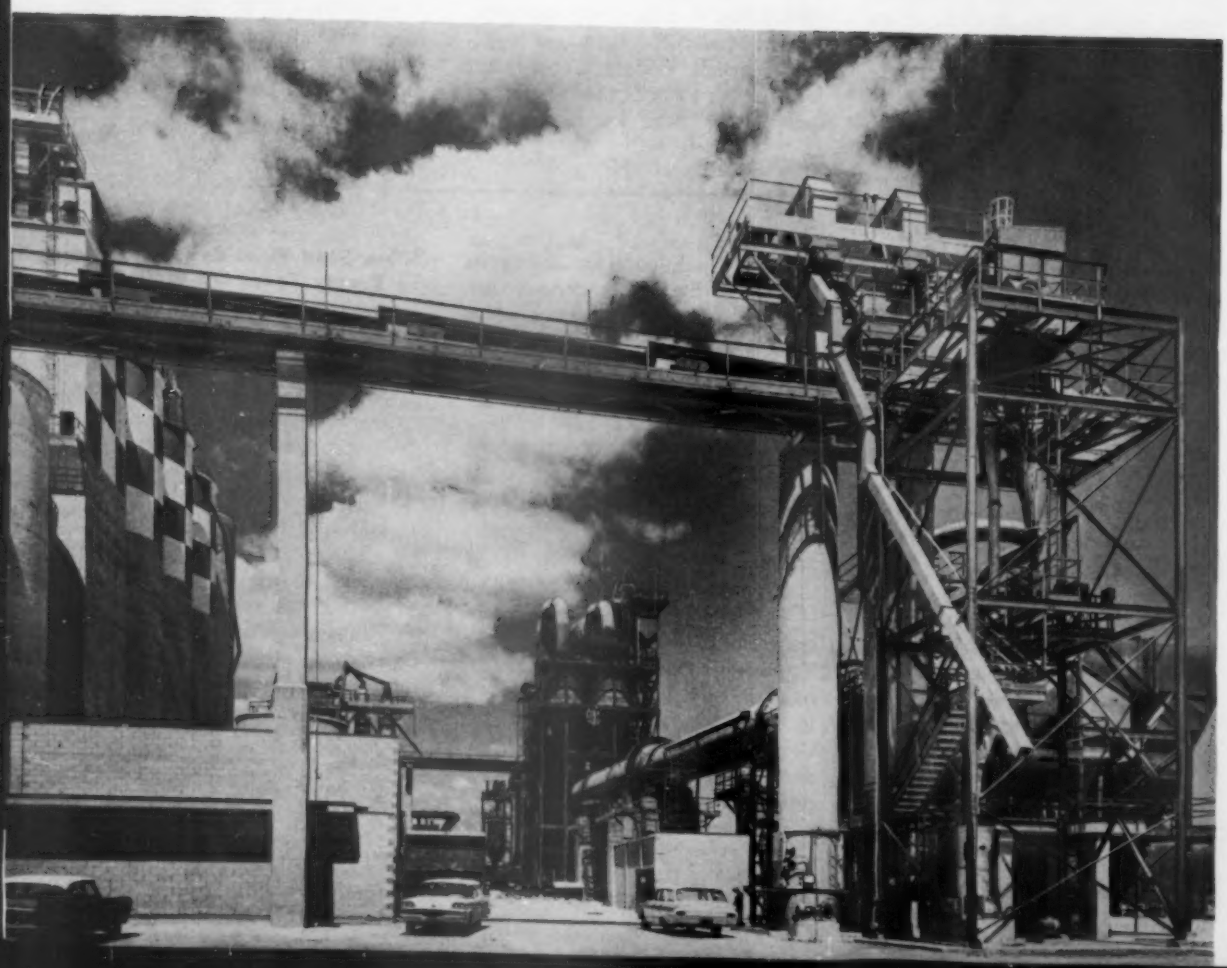
Consolidated Sand & Gravel, Ltd., Toronto, Ont., a subsidiary of Standard Paving and Materials, Ltd., has acquired the Malton, Ont., plant of Commercial Sand & Gravel Ltd.

The Malton plant, added to the one completed last fall in Pickering Township, Ont., brings the total number of Consolidated's plants to five. (The others are at Paris, Guelph, and Freelton, Ont.) Plans are also under way for the construction of a crushed stone plant at a site north of Malton.

Silica Sand Plant Built To Supply Texas Oil Wells

Heart of Texas Mining Company recently opened a two-stage silica sand proceessing plant with a capacity of 37½ t.p.h. The setup supplies material for the sand fracturing process of oil recovery.

The primary processing operations (up to the drying stage) are located near the deposits at Voca, Tex. The second stage of the plant, near the rail line at Brady, handles all final operations, including drying, final screening and bagging. Engineering of the conveyors, elevators, screens, and belt feeders was handled by Hewitt-Robins. W. O. Ferguson is president of the company, and Clarence Wheeler is in charge of plant operations.



Hawaiian Cement Corporation Paces Progress in 50th State

$12,000,000 plant supplying islands with 1,000,000 bbl. of cement per year

By HARRY F. UTLEY

APPROACHING its second anniversary of statehood, Hawaii is riding the crest of a roaring boom. Population is exploding. Tourism is reaching new heights. But, except for pineapples, sugar cane, some timber, and increasing herds of beef cattle, most of the things Hawaii needs must be shipped over from the mainland.

Some new industry has come, and heading the list is portland cement. The new 1,000,000-bbl.-per-year plant of the Hawaiian Cement Corporation, erected in 1959-1960, is now in full-scale production. The first truckload of cement from the new facility on the island of Oahu was shipped on August 12, 1960, the day of formal dedication.

Located on a 27-acre parcel at Barber's Point, just 21 miles from the heart of Honolulu, the $12,000,000 plant has become one of Hawaii's chief industrial consumers of fuel oil and electric power. Since fuel economy is of paramount importance, one of the early major decisions of the owners was to adopt the fuel-saving dry process of manufacture. There is no petroleum production on the islands, and all oil must be shipped in *via* tankers. The kiln also utilizes 2-stage flash preheaters, so that its short (240 ft.) length permits a low demand of about 800,000 B.t.u. per barrel of clinker produced.

Raw Materials Mineral exploration began in 1957. At Barber's Point, on the leeward side of Oahu, huge deposits

Opposite page, top:
THIS AERIAL VIEW of Hawaiian Cement's Barber's Point plant, 21 miles from Honolulu, was taken just prior to initial operations. The 240-ft. dry process kiln at the right is oil-fired, and receives feed from 2-stage flash preheaters.

Opposite page, bottom:
A CLOSEUP OF THE KILN INSTALLATION showing the preheater at the feed end, the open firing floor and cooler structure at the right, and raw storage silos at the left. At ground level on the left is the concrete masonry building housing remote control panels for both the kiln and the kiln feed homogenizing system.

Right:
FINISHING MILLING CIRCUIT. The two closer bucket elevators are in the finish milling circuit. That at the left handles the finished product, and the one on the right recycles rejects to the mill. The tall elevator in the background delivers cement to the top of the product silos.

of exposed coral limestone reef revealed an ideal source of the chief raw material. A few miles away, up the weathered slopes of long-quiet Waianáe and Koolau volcanoes, there is an abundance of basaltic and trachyte lava to furnish the necessary silica-alumina-iron components. Deficiencies in silica are made up by using silica sand, which must be imported from deposits in western United States, South America, and some from far-off South Vietnam.

Limestone (the coral rock) is quarried from a 533-acre deposit only 3 miles from the new plant. Ripper teeth on D9 Caterpillar bulldozers tear out the coral for loading and truck delivery to the plant. The owner of the coral deposit, the James Campbell Estate, eventually plans a deep-water harbor to accommodate ocean-going freighters on the site; and much of the coral, some of it standing 20 ft. above sea level, would have to be removed for the construction of the harbor and port facilities. This amount of coral limestone alone will be sufficient to supply the needs of the cement plant for more than 20 years.

A typical analysis, percentage-wise, of the coral limestone is as follows: CaO, 53.85; MgO; SiO_2, 0.57; Al_2O_3, 0.55; Fe_2O_3, 0.42; Na_2O_3, 0.39; K_2O, 0.04; losses, 43.-22; total 99.74.

Basalt and trachyte are excavated from outcroppings within 15 miles of the plant, and after primary crushing, trucked to the new plant at Barber's Point. Annual raw-material needs are estimated at 237,-000 tons of coral rock, 54,000 tons of basalt and trachyte, and 9,000 tons of silica sand.

There are two 40-ton capacity side-by-side truck-dumping hoppers at the plant. One receives the coral rock and quarry-run gypsum exclusively and, by way of a vibrating feeder, loads a 54-in. wide belt conveyor running up to a 50- by 60-in. Universal Bulldog hammermill. Powered by a 600-hp. motor, this mill reduces the coral to minus ⅜-in. kiln-feed size.

The other 40-ton hopper receives the minus ⅜-in. silica sand, crushed basalt, and trachyte. Limestone, gypsum, sand, basalt, and trachyte are carried (separately) by a 30-in. wide belt conveyor running up to the bank of raw storage silos.

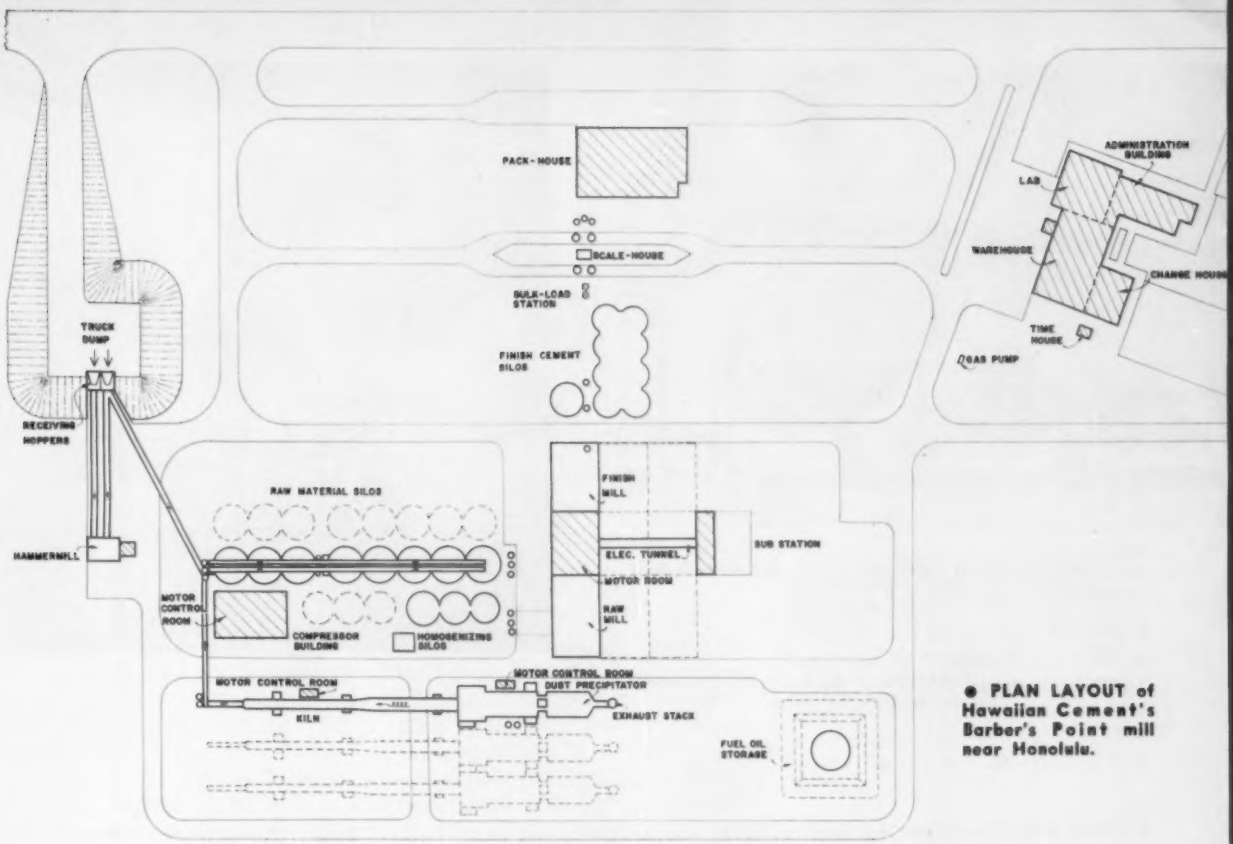
A separate concrete-block building adjoining the crushing structure houses the control equipment with which one operator can regulate the entire raw-material-handling system, from the receiving hoppers to the selection of the proper silo into which the raw material is directed.

Dumping and handling of the raw materials naturally creates a good deal of dust and fines at the hoppers. These are not wasted; instead, they are efficiently recovered by an exhaust fan and Micro-D bag-type dust collectors installed high above the hoppers. A total record of all raw materials going to the silos is kept by a conveyor scale on the delivery belt.

Mill Feed Storage, Handling There are eight concrete silos arranged in line. Only six of these are used for raw storage, however; the other two store clinker from the kiln. All silos are 36 ft. in diameter. The first three in the line are 90 ft. high; the other

Above:
CRUSHING. Coral rock and quarry-run gypsum are reduced to minus ⅜-in. by a 600-hp. hammermill in this crushing installation on the plant site.

Below:
KILN OPERATION is remotely-controlled from the panel at the right. Control is facilitated through the provision of a TV monitor and a schematic layout of the system with indicator lights (at the top). A control panel for the kiln feed homogenizing silos and handling system is also installed in this room.

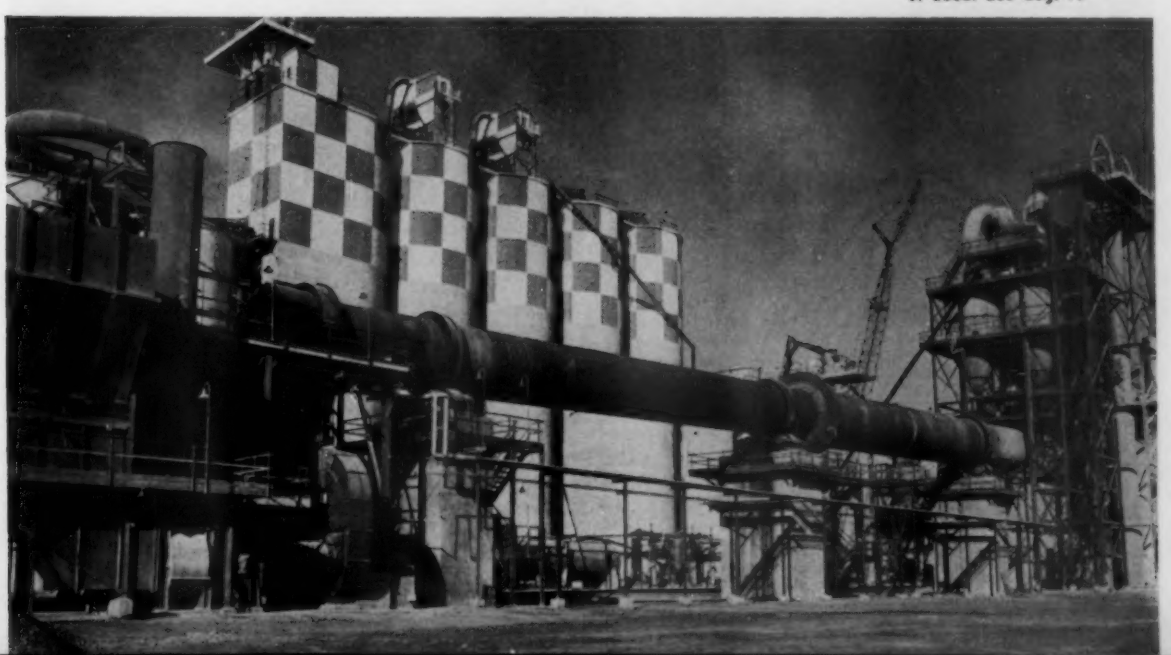


● PLAN LAYOUT of Hawaiian Cement's Barber's Point mill near Honolulu.

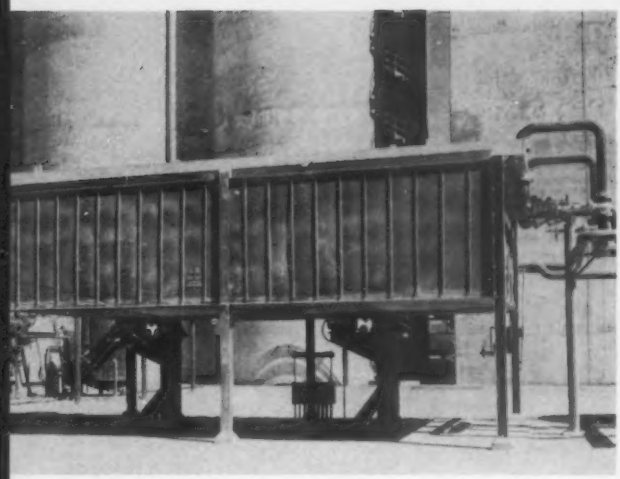
five are 134 ft. high.

From the raw-material delivery belt, the various sized components are carried by bucket elevators to the tops of the silos and distributed by an interconnected system of belt conveyors to the proper ones. Raw material is drawn from the storage silos with Carrier volumetric feeders. Normally the material is delivered to the raw-grinding bin and ground as a separate component. One Merrick belt scale provides the total weight of each ingredient which has been drawn and separately ground. Standardization was made throughout the plant's material handling systems on Westtern Gear drives.

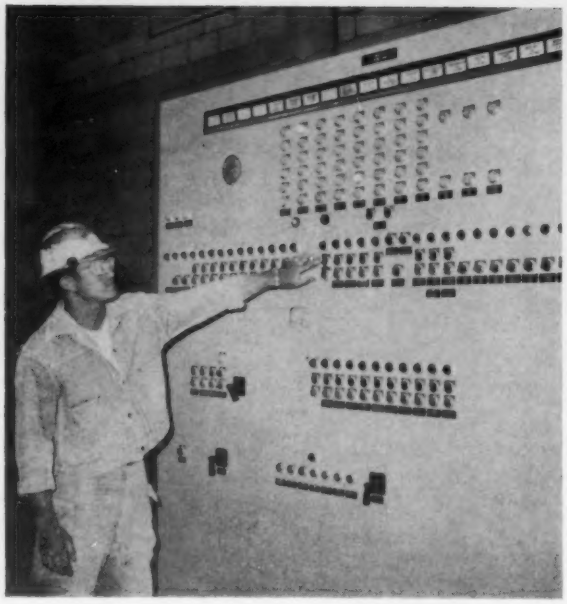
(Turn Page)



KILN FEED enters the kiln from the preheaters at the right at 1,100 deg. F. Jacket-type exchangers around the kiln exhaust ducts at the preheater exits are used to raise the temperature of the fuel oil to the required level before firing. Clinker discharged from the air-quenching grate-type cooler (left) has a temperature of about 200 deg. F.

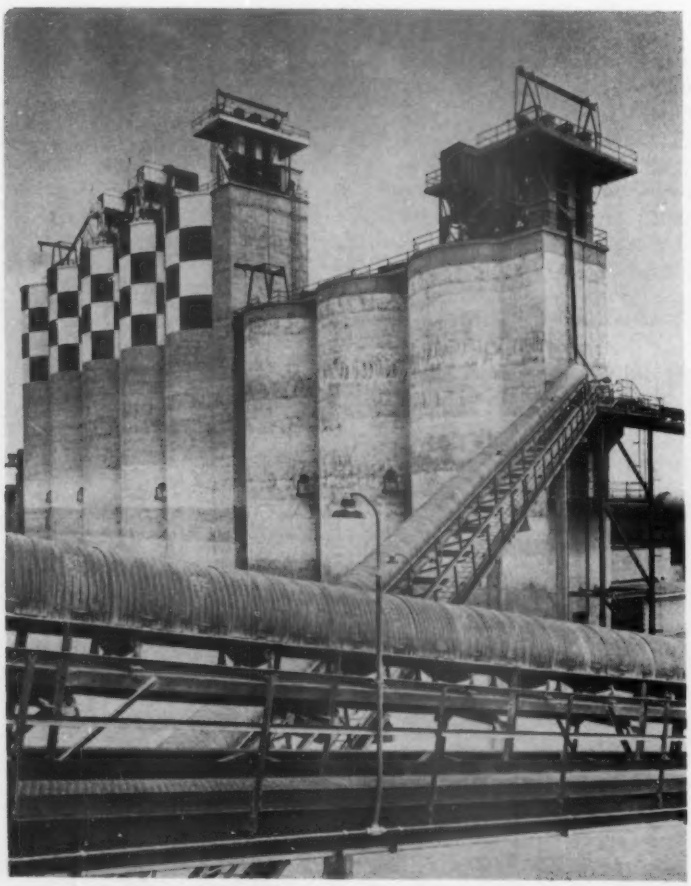


Above:
WATER FOR BEARING COOLING is processed through these air-cooled heat exchangers.



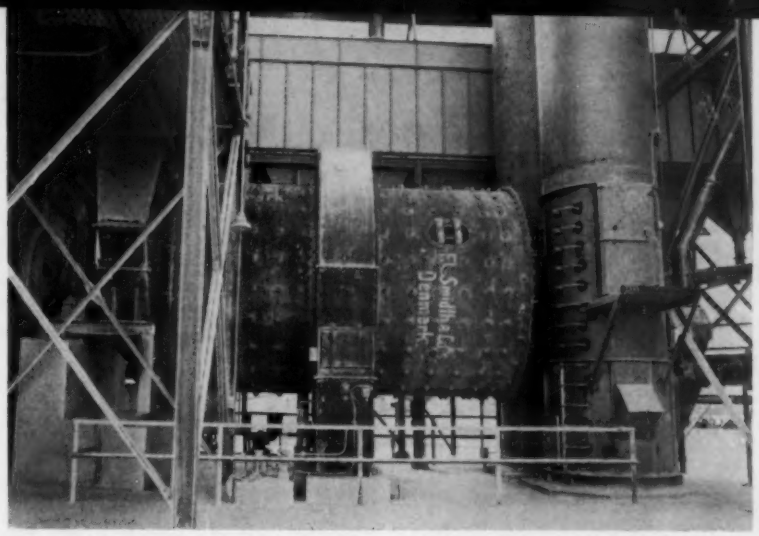
Right:
OPERATION of the finish milling circuit is controlled from this panel.

Below:
STORAGE SILOS. Six of these 36-ft. diameter silos are used for storage of raw materials. The other two accommodate clinker.



Raw Mill The 12- by 19-ft. F. L. Smidth raw mill is served by a weighing belt feeder from the raw-feed bin. The mill carries a 77-ton charge of steel balls with a maximum size of 2½ in. It is supported on a central slide shoe bearing and a guide bearing at the inlet end. A 1250-hp. G-E motor drives the mill at 17.6 r.p.m. through a Symetro gear unit. All electrical equipment in the operation was supplied by G-E. The mill is airswept and close-circuited with a company-designed air separator, followed by a baghouse containing 1,728 bags for final dust cleanup and recovery. After grinding, the properly sized raw feed is elevated and delivered to three blending silos for dry homogenization in a company-designed system. Mill control is based upon samples from these silos.

Raw Mix Handling The three homogenizing silos, each 32 ft. in diameter and 53 ft. high, receive and blend the pulverulent raw material. Each silo has a sloping bottom made up of a mosaic of 1-ft. square porous ceramic plates. These plates permit the percolation of compressed air at 20 p.s.i. to filter up through the material, fluffing, circulating, and blending it with-



THE FINISH GRINDING MILL, shown here, and the raw mill are identical 12- by 19-ft. units on opposite sides of a motor room housing their 1,250-hp. motors.

in the silo. After homogenization has been completed, the mix is screw-conveyed and elevated to the kiln-feed tank. Each of the three blending silos has sufficient capacity to supply the kiln for 24 hours. Thus, it is possible to be filling one with the various raw components, aerating, homogenizing, testing in the second silo, and supplying feed to the kiln from the third.

Kiln Operation The 10- by 12- by 240-ft. F. L. Smidth kiln turns at about 1 r.p.m., rides on three tires, and is driven by a 100-hp. motor. The shell is of a special design without stiffener rings. Stand-by emergency drive is provided with a Hercules gas engine and a related reducer and couplings. Plant layout is such that, should increased production capacity ever be desired, more kilns may be installed without disrupting production. The same is likewise true in the plan of the mill building, storage silos, etc.

As mentioned, the kiln is served by a pair of F. L. Smidth designed cone-shaped preheaters. After a 2-stage flash-heat exchange, the raw mix (at 1,100 deg. F.) is fed into the kiln, which is fired by Bunker C oil. Oil temperatures must be maintained no lower than 325 deg. F. at the burner; and the required heat is obtained from jacket-type exchangers around the kiln-exhaust ducts at the preheater exits. Use of the waste heat reduces the kiln-gas temperature from about 1250 deg. at the preheater exits to 800 deg. The kiln is also equipped with an internal water spray cooling system at the inlet end.

Dust recovery from the kiln is by way of a 500-hp., 83,000 c.f.m. induced-draft fan, multiple cyclones, and a Western Precipitation Cottrell electrical precipitator. The cleaned gases enter the cyclones at 550 deg., max., and escape into the atmosphere through a 100-ft. stack at 500 deg., max. Recovered dust can be drawn off for agricultural use, and as such is probably more valuable as a by-product than if returned to the plant circuit. The dust is stored in truck-loading bins nearby.

DISTRIBUTION OF FINISHED CEMENT from silo to bulk truck-loading points is controlled from this panel in the weigh house. An 8-acre water area has been provided to harbor barges for bulk water shipment and also to handle incoming barges of raw materials.

Instrumentation The highly instrumented kiln is remote-controlled from the quiet, air-conditioned control building some distance from the firing floor. All control equipment is electronic, with electro-pneumatic activation of the various drives and valves. The electronic recorders and controls were supplied by the Foxboro Company; damper drives, fuel-flow meters, and gas analyzers are products of the Bailey Meter Company.

In this room, the kiln operators are constantly aware of conditions relating to kiln feed, preheaters, calcining and burning zones, fuel, and clinker cooler, and they can regulate set points so that the burning operation is automatic to a high degree. A Vicon TV monitor, closed-circuited with a camera mounted at the discharge end of the kiln, shows conditions of combustion, charge, and the clinkering point in the burning zone.

In planning the plant, the control of the homogenizing silos was deemed so critical and important to the proper operation of the kiln, that the remote-controlled electronic panel board for the silos is also located in the kiln-control room,

(*Concluded on page 97*)

First International Symposium on Agglomeration

R. R. McNaughton, right, president of A.I.M.E., who also took part in the program, is greeted by W. B. Stephenson, general chairman of the highly successful meeting.

UNDER the sponsorship of the American Institute of Mining. Metallurgical and Petroleum Engineers, the first International Symposium on Agglomeration was held in Philadelphia, Pa., on April 12-14. All phases of sintering, pelletizing, nodulizing, and briquetting, as related to ferrous, nonferrous, metallic, and nonmetallic materials, were covered. Total registration was in excess of 600 persons.

The international aspect of the symposium was evidenced by papers presented by authors from many countries. Australia, Japan, Sweden, Germany, Brazil, Scotland, and England were represented by the speakers. In addition to these authors, Norway, Belgium, and France were also represented.

This highly successful meeting was arranged by the following chairmen and their committees, under W. B. Stephenson, general chairman, and Newell Appleton, vice-chairman: Dwight Brown, program; W. A. Knepper, publications; W. F. Rappold, arrangements; William S. Cumings, finance; and Mrs. H. E. Allen, ladies' entertainment.

Papers were presented by the authors (or their representatives) in the form of abstracts, supplemented by slides. Each presentation was followed by discussion. All papers and discussions are to be included in a bound volume, to be released later this year.

Papers covered the wide range of agglomeration, from theoretical aspects of pellet formation and behavior to the use of these pellets in commercial practice. Among the papers covering fundamentals of pelletizing were the following: *Dynamics of Pelletization*, U. S. Steel Corp., Monroeville, Pa., U. N. Bhrany, R. T. Johnson, T. L. Myron, E. A. Pelczarski, presented by U. N. Bhrany; and *The Strength of Granules and Agglomerates*, Lehrstuhl und Instit für Mechanische Verfahrenstechnik, Karlsruhe, Germany, by H. Rumpf, presented in brief abstract by J. H. Brown in Mr. Rumpf's absence.

The paper presented by Mr. Bhrany presented formulas and statistics pertinent to the operation of disc pelletizers. This author stated that disc pelletizers are both agglomerators and mixers. To summarize, three primary functions of the pelletizer are: (1) to blend the feed particles, (2) to generate nuclei, and (3) to grow nuclei to the required size to form pellets.

The paper presented for H. Rumpf reviewed the bonding mechanisms of the different kinds of agglomeration. An equation was presented for the calculation of the tensile or shear stress of agglomerates. The tensile strength is shown to be a function of particle size, porosity, and the bonding force at a point of contact. Among the various test results reported in the paper is a mention of cement. According to this author, "Pellets made from cement powder of wide particle size distribution have low porosities."

One paper in the nonmetallic field covered pelletizing of cement raw materials for the preparation of feed for straight kilns and feed for grate-type kilns.

In some papers the use of self-fluxing sinter and additives (lime or dolomites) to concentrates was discussed. Research, design, and commercial plants were covered in many papers. One presented a review of literature, entitled, *A Survey of the Literature Pertinent to Iron Ore Pelletizing*. It was authored by T. K. Goldstick, Jones and Laughlin Steel Corporation, Pittsburgh, Pa.

Although this paper was not given orally, it is available as an excellent source of information on the subject of agglomeration.

The spectacular increase in sinter and pellet production in the last ten years was brought out in certain papers. Improved performance of blast furnaces has resulted from

this development. Pelletizing became more prominent from 1950 to 1960. It is expected by some people to overtake the sintering process for the preparation of finely divided concentrates.

In the various discussions the lack of an international system of testing or evaluating pellets became obvious. Standardized procedures remain to be agreed upon in this field. In some cases, comparison of results must await completion of some testing by the same procedures in different laboratories.

A welcoming luncheon was held on the first day of the meeting, Wednesday, April 12. The principal speaker was R. R. McNaughton, president of A.I.M.E.

On the evening of the second day, a fellowship dinner was held for all in attendance. The following representatives of metallurgical societies from eight countries participating were introduced:

R. R. McNaughton, A.I.M.E., New York; manager, Metallurgical Division, Consolidated Mining and Smelting Company of Canada, Ltd.

Frank A. Green, AUSTRALASIAN INSTITUTE OF MINING AND METALLURGY, Melbourne; manager and director, Broken Hill Associated Smelter Pty., Ltd. — Australia.

F. J. McMulkin, CANADIAN INSTITUTE OF MINING AND METALLURGY, Montreal; Dominion Foundries and Steel, Ltd.—Canada.

Dr. H. Sawamoto, MINING AND METALLURGICAL INSTITUTE OF JAPAN, Tokyo; Nagoya University—Japan.

Aksel K. Prestrud, NORWEGIAN METALLURGICAL SOCIETY, Oslo; Electric Furnace Products Company, Ltd.—Norway.

John Stalhed, L. K. AB., SWEDISH IRON MASTERS' ASSOCIATION, Stockholm—Sweden.

Dr. Ing. H. Wendeborn, GERMAN MINING SOCIETY, Dusseldorf; "Lurgi"—Germany.

Jacques Astier, FRENCH METALLURGICAL SOCIETY, Paris; Iron and Steel Research Institute—France.

Dr. A. Decker, BELGIAN ROYAL SOCIETY OF ENGINEERS AND INDUSTRIALISTS, Brussels; National Metallurgical Research Center—Belgium.

The principal speaker at this dinner was Gaylord P. Harnwell, president, University of Pennsylvania, who spoke on *Education in the World Community*. This speaker discussed the establishment of new institutions of learning in some of the lesser developed countries of the world and stated that many of these are patterned after American colleges and universities. One thought behind this development is the desire of the governments of these countries to keep their talented and educated people at home. Mr. Harnwell pointed out the difference between the sciences and humanities, stressing that the developments of science must be placed in the hands of those skilled in the field of humanities.

An interesting addition to the program was a conducted tour of the iron ore pelletizing plant at the Grace Mine, Morgantown, Pa., on Saturday, at the invitation of the Bethlehem-Cornwall Corporation. This new plant has six furnaces, each having a capacity of 1,000 tons per day of pellets. The iron ore concentrator has four mill units, each with a 100 t.p.h. capacity of 44 percent iron magnetite ore.

Above: Some of the members of the symposium advisory board who contributed to the development of the interesting sessions include (l. to r.): K. H. Roll, T. B. Counselman, W. B. Stephenson, F. H. Hamilton, and C. F. Clausen.

Left: Among the committeemen assisting the general chairman were Newell Appleton (vice-chairman, arrangements), W. F. Rappold (chairman, arrangements), Mrs. H. E. Allen (chairman, ladies committee), Mr. Stephenson, D. C. Brown (chairman, program), and W. A. Knepper (chairman, publications).

Diversification accompanies operating expansion

Long Island operator plans for tomorrow with new high-capacity plant, future product additions, worked-out area development

By BUREN C. HEROD

THE burgeoning population and consequent construction requirements in Long Island, N. Y., have made heavy demands upon material suppliers and other services. Prominent among the farsighted men who have not only successfully kept pace with these demands but are anticipating future needs is Virgil Price, president of East Coast Lumber Terminal, Farmingdale, L. I.

A new 900-t.p.h. operation, known as West Hills Sand & Gravel, constructed by Mr. Price just a year ago, has the capacity and reserves for many years of peak production. The foresight involved in planning for the new operation is also evident in a much different, but related, objective.

The firm's original operations at Farmingdale, which the new plant will fully replace, are being curtailed; and comprehensive plans were drawn up for an extensive industrial development, already under way, on a larger part of the old pit site. In the last 20 years over 10,000,000 tons of sand and gravel were removed from the Farmingdale property, to a 20-ft. depth, and little more will be removed.

A considerable acreage is involved at both the Farmingdale location and the new West Hills site a few miles to the north. Acquisition of large areas was based on the premise that this would permit operating without having close neighbors. Somewhat paradoxically, but logically, this earlier seclusion at Farmingdale has been turned into a potentially very profitable venture, with the development of large sections of the property into industrial sites plus warehouses and terminals for the many commodities required by the rapidly expanding population. As Mr. Price has put it, "We have helped to build Long Island, and now we also want to help feed it."

When it became apparent that the economic life of the Farmingdale pit was drawing to a close, and that increasing emphasis should be placed on the development program for that property, the tract acquired at West Hills over the years was brought into service to supply the Farmingdale plants (three sand and

The compact plant is presently exclusively a screening facility, equipped with 10-single-deck sizing units, and it is rated at 900 t.p.h. At the right is a historical memento —the only remaining overpass abutments from the old Vanderbilt Motor Parkway, the "granddaddy" of expressways. The discharge of the main belt is about 170 ft. above excavating level, and since it is said to be the highest industrial structure on the island, the over-all installation was designed to withstand 100-m.p.h. winds. Larger than normal gates—32 in all—below the bins contribute to rapid loading cycles.

One of the best operating sites remaining on the land side of Long Island has been utilized for the new West Hills operation. This view of the pit shows the portable field conveyor units that supply the stationary main feed conveyor (right).

Right: Drive and takeup for the 36-in. main conveyor are installed at an intermediate point to eliminate a heavy drive installation at the head pulley, and to avoid spillage onto the drive.

gravel, and a bituminized aggregate facility). The truck haul between the two points proved to be an unfavorable cost factor, and the decision was made to build a plant at West Hills.

The latter area is probably one of the best operating sites remaining on the "land" side of the island, and covers at least one square mile. In addition to the extensive aggregate reserves available, the bed of sand and gravel is underlain by a deposit of silica sand more than 300 ft. deep. Future processing of the latter material is anticipated.

Current excavation is in a 60-ft. high bank which provides pit-run plant feed with about a 30/70 gravel-sand ratio. A single 3-cu. yd. P&H now installed in the pit furnishes direct feed to a field conveyor system on which flow to the plant is initiated. When the operations at Farmingdale are completely shut down, the present shovel at West Hills will be joined by a companion unit, and the full 900-t.p.h. capacity of the new plant will be utilized.

Both the older and newer plants were designed and built under the personal direction of Mr. Price. Although the Farmingdale operation was his first venture in commercial aggregate production, he brought to it years of experience in heavy construction, mining, and quarrying in the West, and resultant knowledge of efficient operation.

The West Hills plant, presently exclusively a screening facility, has considerable versatility in a compact layout. In the two major equipment categories, standardization was made on single-deck Deister screens, and on Hewitt-Robins conveyors.

Pit-run material dumped into the field hopper by the pit shovel passes through a large bin gate onto the the first of a series of 36-in. by 105-ft. horizontal field conveyors. When the digging rate increases with the addition of another shovel, the field hopper will be fitted with a belt feeder.

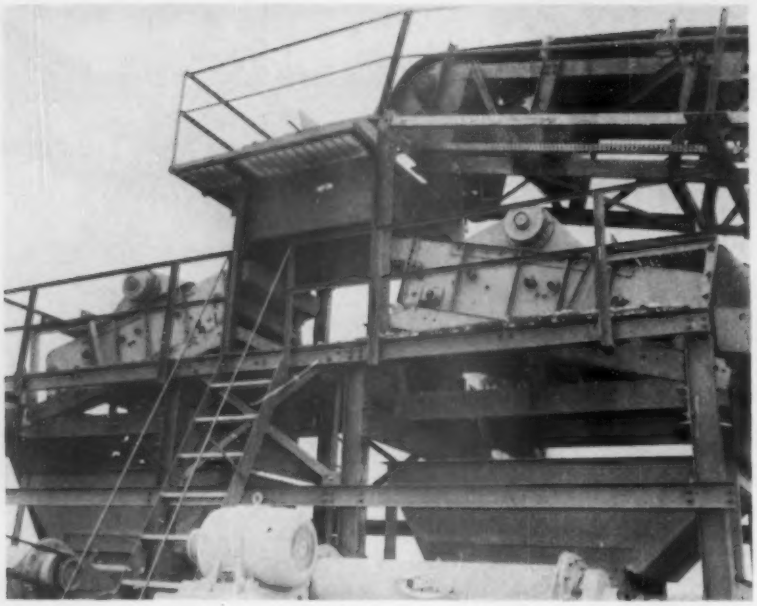
From the final field unit the material is received on the inclined main plant feed belt and carried at 450 f.p.m. out of the pit. This main conveyor is 455 ft. o.c. and is fitted with a 36-in. belt. The discharge point at the top of the screening plant is about 170 ft. above the excavating level. A 125-hp. G-E motor and a Jones reducer furnishing drive for the main belt, and the takeup, are installed at an intermediate point between the head and tail pulleys. This eliminates a heavy drive installation at the head pul-

ley, and also avoids such difficulty as spillage onto the drive. The overall structure was designed to withstand 100 m.p.h. winds—an important factor since this is said to be the highest industrial structure on the island. It rests on high ground, centrally located in the tract, with pit areas on both sides.

Flow of material through the plant is divided between two sets of screens with five in each set. The main belt discharges into a feed box, from which the material passes to an underlying pair of 4- by 8-ft. scalping screens mounted back to back. Oversize from both is rejected over the bank adjacent to the plant.

Throughs from each scalper pass to the respective pair of sand screens, the units in each pair also being mounted back-to-back (see accompanying schematic drawing). One pair of these 5- by 10-ft. screens is fitted with ⅜- by 4-in. opening screen-cloth. The companion pair of sand screens has ¼- by 4-in. openings. Throughs from all four drop to the appropriate underlying bin.

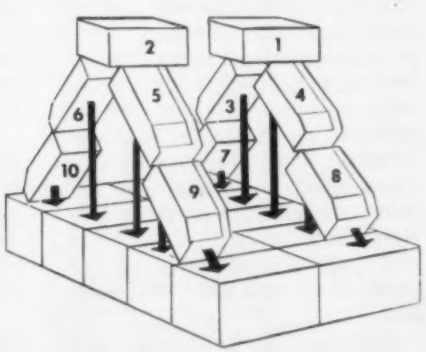
Each sand screen discharges to a following 4- by 6-ft. gravel screen. The latter four are identically fitted with, for example, 1⅜-in. opening screen-cloth. Retained and through fractions are placed in the remaining eight bin sections.



Above: At the top of the plant the feed is split for processing in two separate sets of screens, with five in each group. The two screens shown here are 4- by 8-ft. scalpers.

Left: Two of the 5- by 10-ft. sand screens. Behind each of these is an identical companion sand screen, and the back-to-back pairs are fed from the respective scalper above. Each sand screen discharges retained fractions to a following gravel screen.

Below: A schematic drawing of the screening sequence. Plant feed is first split to a pair of scalpers (1 and 2). Scalper throughs are then split to paired sand screens (3 and 4, and 5 and 6). Each sand screen discharges onto one of four identical gravel screens (7, 8, 9, and 10).



Left: Joe Rypka, plant superintendent, in the control house at the top of the screening tower. This location not only permits observation of all screens at close range, but pit operations as well.

The bins are regarded and handled as "working" bins, not storage. Future expansion comprehends ground storage for finished products, with a reclaiming tunnel installation. The plant was purposely constructed near the edge of part of the pit so that a truck-loading tunnel could be built at the foot of the embankment, and materials could be stockpiled above.

The use of single-deck screens throughout the West Hills installation was based largely on the objectives of quick and easy maintenance, and minimum time involved in cloth changes. These are highly significant in a high labor cost area such as that in which this plant is located. According to the plant superintendent, Joe Rypka, a bearing can be changed and a screen placed back in operation within half an hour. Similar units had an excellent service record in the original plant, and that experience led to their installation in the new one.

Control for the entire installation, from the field conveyors through all screens, is housed in a booth at the top of the plant. This location provides quick accessibility to the screens and also permits observing operation of most of the units from one point. A concrete masonry utility building at ground level houses a pair of U. S. motor-driven Johnston pumps with which well water is obtained and transferred to the screen spray bars.

Shipment from West Hills is entirely by truck. Rapid loading cycles have been assured by the provision of larger than normal bin gates, built to Mr. Price's specifications, under the Erie bins. There are 32 loading gates in all. A part of the output is consigned to tenant operations on the property — a ready mixed concrete plant and a bituminized aggregate facility.

To realize the full 900-t.p.h. potential of the new plant, only a small increase in crew would be required. In addition to the superintendent, these would include two shovel runners, two oilers, a groundman, and a loader. If a single large shovel were used in the pit, only a 5-man crew would be necessary.

With the new high-capacity operation well established, the raw material already available for future development of silica sand production, and an industrial development program well under way on a worked-out property, Mr. Price and his firm present an exceptional and progressive picture of diversification.

Hawaiian Cement Corp.

(*Concluded from page* 91)

within arm's reach of the kiln-control panel. Also furnished with a Foxboro instrumentation system with electro-pneumatic field controls, the panel for raw feed gives the kiln operator the immediate selection and control necessary to effect the desired co-ordination of the mixing and burning operations. Without this co-ordination, much of the advantage of automatic kiln control could not be realized.

Finish Milling Clinker, at 2300-deg. as discharged from the kiln, is cooled to about 200 deg. over a Smidth Folax horizontal air-quenching grate-type cooler. It is then carried by vibrating conveyors and an elevator to the two silos for storage.

A small but constant sample of clinker is diverted to a sampler just above the cooler. Here the sample is immediately ground to proper fineness in a Raymond Imp mill and taken to the laboratory for physical and chemical testing.

Two clinker silos and a gypsum silo are equipped with weighing feeders which are electrically connected to provide proportioning control. The mixture of gypsum and clinker leaves the silo area *via* Jeffrey vibrating conveyors for transfer to the single mill bin. This bin is supplied by a Carrier volumetric feeder controlled by a Merrick belt scale. The finish mill is a duplicate of the one on the raw side, except that it is the gravity type. It is closed-circuited with a 16-ft. Raymond air separator followed by cloth-bag collectors. Rejects are returned from the separator to the belt scale, so that feed to the mill is held to a predetermined weight. Withdrawal of clinker and gypsum from the mill bin is in such quantity as is required to supplement the returning rejects. Finished cement is transferred to storage in eight 10,000-bbl. silos.

Loading For bulk loading into trucks, four 25- ton weigh hoppers are so arranged that two cement trucks can load simultaneously. (It is anticipated that about 90 percent of shipments will be in bulk.) A 4-tube packer is used for sacking the remainder of the product. All five standard types of cement can be produced at this plant.

The extensive instrumentation utilized in the plant proper also includes a remote-control panel at the bulk-loading station. These various installations reflect experience gained in successful instrumentation and remote control at the Riverside plant in Oro Grande, Calif.* Preheaters on the kiln and the dry homogenization in the blending silos are patterned to a great extent after installations in the Oro Grande operation.

Officers This plant on the mainland is a subsidiary of the American Cement Corporation, which, together with Cyprus Mines Corporation, represents major ownership of the Hawaiian Cement Corp. Late in 1960, Robert D. Fisher, president during the construction of the Hawaiian plant and its shakedown period, was named board chairman, and Walter C. Russell was elected president. Mr. Russell, who is also president of the American Cement Corp., was the former head of the Peerless Cement Company.

Howard R. Starke, a veteran with the Riverside Cement Company, Los Angeles, is executive vice-president and general manager of the Hawaiian company. K. T. Mau is the plant manager. J. Siu is maintenance superintendent, and Bill Low is plant chemist. Ninety-seven percent of the plant personnel at Barber's Point are "kamaainas"—that is, local residents.

Erection of the plant was a joint contracting venture of the Bechtel Corporation and the Hawaiian Dredging & Construction Co., Ltd.

**Electronic Computer Controls Cement Production Variables*, by Harry F. Utley, PIT AND QUARRY, March, 1960, pp. 86-91.

AUTOMATION
featured at
A.I.E.E. cement industry technical conference

By WALTER E. TRAUFFER

ANOTHER ON THE SPOT REPORT

THE third annual Cement Industry Technical Conference of the American Institute of Electrial Engineers, sponsored by the Cement Industry Subcommittee, was held April 18, 19, and 20, 1961, at the Sheraton-Cadillac Hotel, Detroit, Mich. For the third successive year this meeting was attended by over 300 key operating technical men from nearly every major cement company in the United States and Canada and experts from the various manufacturing and engineering firms serving the cement industry.

Under the guidance of J. F. Hower (Lehigh Portland Cement Co., Allentown, Pa.), general chairman of the subcommittee, and L. E. Swanson (Peerless Cement Co.), program chairman, a five-part program comprising 19 papers on distribution, automation, maintenance and safety, and drives and related products was presented during the two-day general sessions. On the final day there was a well-attended plant tour to the new Enrico Fermi Atomic Power Plant at Monroe, Mich., and the new Dundee Cement Co. plant at Dundee, Mich.

Walter A. Allan (Universal Atlas Cement Division, U.S. Steel), past general chairman, and John F. Hower (Lehigh Portland Cement Company), re-elected general chairman.

At the annual banquet R. E. Stroppel, (The Tool Steel Gear and Pinion Co.) was toastmaster. The featured speaker was C. B. Baker, president of the Universal Atlas Cement Div., U. S. Steel Corp., who spoke on the *Permanence of Change*. He pointed out the increasingly important role of the electrical engineer in the modern era and the need for a broad background of knowledge. At the banquet Mr. Stroppel introduced V. E. Metcalfe, of Mexico City, a consulting engineer to the cement industry, who has been a member of the A.I.E.E. for 52 years.

The guest speaker at the general luncheon was Roblee B. Martin, president of the Dundee Cement Co., Dundee, Mich. He stressed the position and future of Michigan as a marketing and manufacturing center. It has many natural resources and a high percentage of skilled labor, scientists, etc.

All officers were re-elected at this meeting: J. F. Hower, (Lehigh Portland Cement Co.), general chairman; R. J. Jager (Lone Star Cement Corp.), vice-chairman; R. E. Stroppel (The Tool Steel Gear and Pinion Co.), advisory chairman; and E. A. E. Rich (General Electric Co.), secretary. The next meeting will be held April 3, 4, and 5, 1962, at the Chase Hotel in St. Louis. John B. Woodward (Bendy Engineering Co.) is program chairman.

AUTOMATION

Again, as at the last meeting, the subject of automation created the most interest. This session, the final one, was again moderated by A. H. Huelsman (General Electric Co.).

Basic Concepts *Some Basic Concepts Involved in Automating Cement Plants* were discussed by E. A. E. Rich (General Electric Co.). This title does not do justice to this very comprehensive paper, which time limitation made it possible to present only in skeleton form. The author first described automation and the typical objectives of process automation. The many steps on the road to automating a cement plant were described in detail, followed by separate discussions of sensing and of the economic justification for automation.

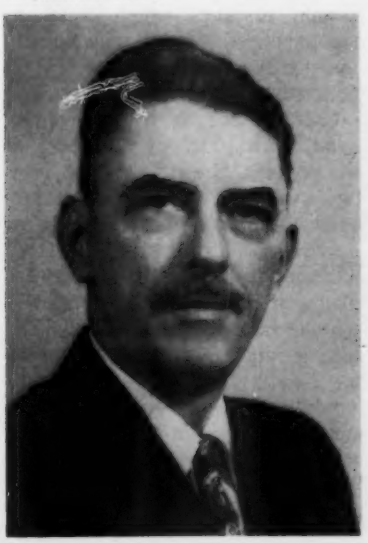
"In closing," said Mr. Rich, "it seems apparent that the risks of gain—or of loss—from automation are high and depend on the degree of care, timing, and understanding used in automating the process. To successfully automate the process requires substantial changes in thought process on the part of many responsible people in a given manufacturing organization and in the thought processes of many of their suppliers.

"Teamwork, training and a 'Let's get on with automation' attitude on the part of all concerned are as essential to successful automation as are the components and technology. These latter items are now almost completely available for the cement manufacturing process. There is no longer any really technological barrier remaining to hinder essentially complete automation of a cement plant."

Ray E. Stroppel (The Tool Steel Gear and Pinion Company), advisory chairman, presented a paper and served as toastmaster at the banquet.

The ensuing discussion brought out the fact that there are about 60 process control computers now in use, many of them in the power and steel industries.

Robert J. Jager (Lone Star Cement Corporation), vice-chairman, presented a paper on electrical drives.



Riverside Computer *The 1961 Status of the Riverside Computer Installation* was presented by LeRoy W. Weeks and D. A. Johnson (Riverside Cement Division, American Cement Corporation). The discussion brought up-to-date a paper presented a year ago. This computer has been in use since September, 1959, and is being used regularly for mix calculations and for logging operating data from one of the preheater kilns. From time to time it is used for the solution of statistical problems related to plant operations.

In conclusion, the authors said, "The use of computers in many different applications is growing steadily. Their use in industry for process control is only beginning. Whether or not their use in any particular plant is economically justified must, of course, be determined by a thorough study of the situation. The successful use of process control computers in present plants may soon lead to the building of new plants specifically designed and instrumented for computer control. We feel that our use of the computer has been and will continue to be very useful in our efforts to produce a better and more uniform product at the lowest cost consistent with fine quality."

Centralized Controls *Our Experiences with Instrumented and Centralized Controls in Cement Plants* was the title of an address by Walter Walkling (Ideal Cement Company). This company now has three plants using a centralized control system, and the results have been entirely successful.

"Ideal Cement Company has attempted to look forward to the various possible applications of instruments and controls," Mr. Walkling stated. The potential of each device capable of serving some needed function for the operator was tested. Over the last 30 years the various aspects of both kiln and mill operations have been studied more closely, and the need to control and measure the variables (has been) recognized. The more refined the measurement and control became,

The inspection trip following the meeting included the new Enrico Fermi Atomic Power Plant at Monroe, Mich.

W. G. Lefferts (Allis-Chalmers Manufacturing Company), who heads the committee on drives, moderated this session.

the more basic became our knowledge of the process of burning and grinding. As this knowledge became formalized, it became possible to divorce the judgement of the operator from his physical observations. In place of the operator's "know-how," an extensive array of instruments and controls are substituted.

"In our first attempt at centralized control, each department (crusher, raw mills, finish mills, etc.) had its own central board. Communication between departments was provided to facilitate supervision. In this arrangement, however, many devices had to be reset manually, and much information concerning the process visually obtained.

"Our present concept is to integrate all functions at one location. This involves an entirely new concept of plant design and arrangement. Unless the mechanical and structural features of the plant are designed specifically for centralized control, no amount of instrumentation will accomplish the result. Equipment must be selected which can be operated without an attendant and on which any necessary adjustments can be made by an operator remotely stationed.

"The equipment should have incorporated in its design devices which can transmit an indication to the control room that it is operating satisfactorily.

"Finally, it is also desirable for the equipment to be self-protected.

"This, in general, is the problem of centralized control namely: control, monitoring, and protection."

The author then outlined in detail the many factors which must be taken into consideration in installating such a system, and the various operating, control, and safety devices needed.

In conclusion Mr. Walkling said: "It is our feeling that we must have satisfactory manual control of the plant from a centralized control station before complete automation can be successful. At present the kiln control requires the major portion of the operator's time. However, this time is continually being reduced as individual control loops are closed. As we are able to measure more accurately the individual variables and learn more about their causes and effects on others, additional loops can be closed.

"It is believed that the remaining problems, such as the rapid chemical analysis of raw material, will be resolved sufficiently to permit complete automation of at least portions of the plant.

"Centralized control has made possible a better and more uniform product. Maintenance and fuel costs have been reduced. The availability of equipment has been increased and over all production increased."

Recommended Practices

Recommended Practices for Automating Operation of Processes in Cement Plants," prepared by the Automation Working Group, A.I.E.E. Cement Industry Sub-Committee, were presented by H. P. Cassel (Whitehall Cement Mfg. Co.). In opening, he stated, "In attempting to bring together certain practices which could be recommended towards achieving automated cement production, it is with the full realization that it is probably too early to spell out in detail such practices. However, it is also recognized that broad principles already exist which, if recognized and followed, will allow supervisory control, from a central location, to be applied to cement plants, at a minimum cost, and without the necessity of costly replacement of equipment at the appropriate time."

Mr. Cassel briefly outlined the suggested procedure, begining with a study of the process and the development of adequate flow diagrams. Mechanization of the plant

A. H. Huelsman (General Electric Company), chairman of the committee on automation, presented a paper, and moderated the session on automation.

V. G. Murdock (Allis-Chalmers Manufacturing Company) was the moderator of the session on maintenance and safety.

must be completed to the degree that "material flow is mechanically controllable from remote locations; that quantities of material may be controlled; and that all necessary operation of crushing, grinding, blending, burning, etc., be fully mechanized."

Suggestions were made for application of automation to every major department from crushing through to shipping. In closing, the following brief summary of the approach to supervisory control was given:

1. "A thorough study of the process to obtain complete process knowledge is the first and most important step.

2. "The development of all necessary tools to obtain process information.

3. "Complete mechanization of the process must be achieved.

4. "Supervisory control may now be applied, department by department, eventually encompassing the the entire process."

New Developments *New Developments in Automation in Cement Plants Including Recent Developments in X-Ray Chemical Controls* were described by A. H. Huelsman (General Electric Co.). Because of the broad scope of this subject, a departmental breakdown of the cement plant was used, and items were discussed relating to automation within each of the major departments. A logical step-by-step path of progress to automation was advised. Through such a master plan, . . . "The economic aspect of automation is carefully scrutinized; all engineering is performed; all equipment is defined. The total work insures the success of automation for a specific plant."

MAINTENANCE AND SAFETY

The session devoted to maintenance and safety was presided over by V. G. Murdock (Allis-Chalmers Mfg. Co.), who stressed the close relationship between these two subjects.

Maintenance Function R. E. Stroppel (The Tool Steel Gear and Pinion Co.) briefed his paper on *The Maintenance Function*. He stressed the fact that the human angle is important in any maintenance program. The important middle management group must be treated as part of management, and the entire maintenance and safety program must be the active responsibility of a member of top management.

Accident Costs *What Do Accidents Cost?* was presented by J. R. D. Brown (Portland Cement Association). This was a lengthy and detailed discussion based largely on the experience of the cement industry. The speaker emphasized the cost of personal-injury accidents to the employer, an angle often overlooked, and a method of estimating such costs.

Wiring Safety *Safety Considerations in Control Circuit Wiring* were described by H. P. Cassel (Whitehall Cement Mfg. Co.). He suggested areas in which work could be done, including adequate clearance of instruments in control panels. The use of 440 v. instead of 110 v. was recommended for greater efficiency and reliability. Above all, all work must be done in a safe manner.

Electrical Safety Practices Ernest E. Wilkin (Nazareth Cement Co.) described *Progress Toward Recommended Practices to Improve Safety in Cement Plants*. Such progress is usually slow as the safety angle alone seldom justifies the expense of changing existing installations.

DRIVES, RELATED PRODUCTS

The session devoted to drives and related products was presided over by W. G. Lefferts (Allis-Chalmers Mfg. Co.), who described drives as one of the cement industry's oldest problems. Papers were presented on *Some Aspects of Static Power Supplies for Adjustable Speed Drives*, by A. R. Olds Jr. (Kaiser Engineers) and R. B. Jones (General Electric Co.); *Experiences With Adjustable Speed Kiln and Fan Drives*, by R. P. Scott (Penn-Dixie Cement Corp.) and T. Offrell (F. L. Smidth & Co.); *Low Voltage Control Circuits in Cement Plants*, by J. B. Woodward (Bendy Engineering Co.); *Drives for Dundee's Storage Hall Cranes*, by L. Kraszewski (St. Lawrence Cement Co.), W. C. Kant (Milwaukee Crane Div.), and A. A. Di Frango (Westinghouse Electric Corp.). A *Report on Suggested Recommendations for Electrical Drives in the Cement Industry*, the work of

(Concluded on page 104)

Canadian Institute Of Mining and Metallurgy Meets in Quebec City

THE 63rd annual general meeting of the Canadian Institute of Mining and Metallurgy was held in the Chateau Frontenac Hotel, Quebec City, March 20 and to 22. It was held under the auspices of the Quebec City branch, with the co-operation of the Thetford Mines and Sherbrooke branches. Approximately 1,550 members and guests registered, of whom 470 were ladies.

Panel on Canada's Mineral Industry

W. H. Durrell, president of the institute, presided at the inaugural general session, which took the form of a symposium on *The Position of the Canadian Mineral Industry in the World Economy*. Speaking for the iron mining industry, C. W. Beck, general manager of Algoma Ore Properties, said that iron ore exports have grown from nothing in 1939 to more than 18½ million tons in 1959, placing Canada second among nations exporting ore. If proper incentive is given to the industry, production could be tripled in the next ten years, he said.

K. H. J. Clarke, manager of Canadian sales and market development for International Nickel Company of Canada, Limited, said that increasingly competitive export and domestic markets appear to lie ahead for non-ferrous metals. World trade in the future will be dominated by large economic groups of nations with whom good trade relations must be maintained. However, given reduced labor costs and reasonable taxation, the Canadian copper, lead, zinc, and nickel industries should continue to contribute many millions of dollars to the Canadian economy in the future.

Dr. J. B. Mawdsley, M.B.E., chairman, geology department, University of Saskatchewan, was elected president of the institute.

A varied and interesting program of technical papers was presented by the five divisions of the institute. A resume of some of the papers presented at the technical sessions of the Industrial Minerals Division follows.

Industrial Minerals

In his address, *Asbestos and the Canadian Economy*, Karl V. Lindell, vice-president and general manager of Canadian Johns-Manville Company, Limited, stated that the Canadian asbestos industry's most important contribution to the Canadian economy is through the export of asbestos fiber, and that markets throughout the world have been built up over the years. The Canadian asbestos industry owes its strength to these export markets. Less than 4 percent—40,000 tons—of the current production of 1,100,000 tons of fiber is used in Canada. It would require only 12 working days per year to produce enough asbestos to meet Canadian requirements.

Referring to the intense competition from many countries in world asbestos markets, Mr. Lindell said that Russia now is annually producing about as much asbestos fiber as Canada, or slightly more than one million tons. There were rumors that an export tax might be placed on Canadian asbestos in the belief that this would encourage greater manufacture of asbestos products in Canada. This would not be the result, the speaker averred. He believes that under present highly competitive conditions an export tax on fiber would cause serious harm to the industry, rather than help it. With encouragement and support from federal and provincial governments, asbestos, industry leaders are confident, he said, that this business will continue to bring export dollars to Canada.

In an illustrated paper *What's New In Bulk Materials Handling?*, A. L. Dempster of the Aluminum Company of Canada, Limited, Montreal, reviewed significant trends and recent developments in the handling of large tonnages of materials. A bucket-wheel excavator, developed in Germany, was shown removing overburden up to 800 ft. thick from a coal deposit. One of these machines will be in operation soon at the property of Demarara Bauxite Company in British Guiana, where it will be used in removing more than 200 ft. of overburden from a

bauxite deposit. It is expected that this excavator will remove this depth of soil more cheaply than 80 ft. can be removed with present equipment.

A combination stacker and bucket-wheel reclaimer used with marked success by Algoma Ore Properties, Algoma, Ont., was described. This equipment is utilized to blend iron ore on a stockpile so that a homogeneous product is obtained from the top to the bottom of the pile. These reclaimers are also being successfully used on limestone and coal stockpiles.

A hot-materials conveyor belt made of high-carbon steel coated with silicone rubber, first marketed in 1958, was shown conveying hot aluminum fluoride at the Kitimat, B. C., plant of the Aluminum Company of Canada. Such conveyors are also in use for handling sinter cake at 1100 deg. F., and also for hot portland cement clinker.

Bulk shiploading and unloading systems for handling finely powdered materials such as alumina, and other materials such as crushed limestone and coke, were discussed. The fine materials are moved by pneumatic systems. Air curtains are used to prevent dusting. A major advantage of self-unloading ships is that they can quickly discharge cargoes at ports not equipped with ship-unloading facilities; they also require the minimum of manpower.

H. G. Worsley, Canadian Industries Limited, Montreal, in his paper *Containers, Packaging and Warehousing*, described various methods of efficiently handling ½-ton to 60-ton shipments. He referred to palletizing, and described corrugated containers, metal and rubber bins, and their applications. He also referred to bulk trucks and hopper cars and described a method now under development in which inflatable plastic liners in box cars and vans are used. He stated that these liners have a cost advantage over other bulk-handling containers in that standard carrier equipment can be used, thus obviating the problem of a return freight charge on the container.

Mineral Fillers and Canadian Industry, a study presented by J. H. Morgan, consulting geologist, Montreal, and J. E. Reeves, Mines Branch, Ottawa, covered fillers in general and talc in particular. Dr. Morgan stated that talc has more than 70 uses in industry and the arts, mostly as a pller. In one use, as an ingredient of an auto-body patching compound, it is mixed with epoxy resin and a catalyst and applied to the area to be repaired. The hardened material is then ground to a smooth state and is painted over. The talc functions as a filler that imparts good troweling characteristics. It does not react with the resin or the paint.

Talc is mined in three localities in eastern Canada. The domestic product at present is used mostly for the lower-priced uses in pipeline enamels, as a carrier in insecticides, and for other filler uses. Soapstone crayons are also produced. The tremolite talc used in paints, paper, and ceramics, as well as the high-grade talc for cosmetics, is mostly imported. Research is under way into methods of beneficiating Canadian talc so as to widen its markets.

In his part of the paper, Mr. Reeves described the methods of mining and processing filler minerals. He emphasized the importance of quality control. In conclusion, he said that an obstacle to the greater use of Canadian mineral fillers is the unwillingness of consumer to experiment with the domestic product, coupled with their lack of knowledge of the fillers available.

H. M. Woodroffe, Mines Branch, Ottawa, was elected chairman of the Industrial Minerals Division.

W. H. Durrell, retiring president, presided over the inaugural general session of the 63rd C.I.M.M. annual meeting.

In his paper, *Industrial Minerals in the Chemical Industry*, J. A. McCoubrey, manager, commercial development department, Cyanamid of Canada Limited, Montreal, presented data showing how the production of chemicals and allied products had increased at a much more rapid rate than industrial production in general in the 10-year period 1949-1959. He illustrated the important part played by industrial minerals in the chemical industry by pointing out the indispensability of sulphur, sodium sulphate, salt, limestone, and phosphate. The physical volume of production, the gross value of production of those minerals by provinces, and their utilization by industry were depicted on charts.

Cosmo Marchant, manager, new product development department, Dominion Tar and Chemical Company, Limited, Montreal, presented a paper—*The Future of Construction Products from Industrial Minerals*—in which he stated that asbestos, gypsum, clay, and limestone comprise the base of a vigorous, large-scale industrial minerals industry. He discussed the present situation of each and predicted that the production of these minerals and their derivations would grow in the future but at a rate slightly lower than that of the last ten years.

Industrial Minerals in the Ceramic Industry by M. F. Goudge, consulting engineer, Ottawa, dealt mainly with the great changes that have taken place in the last two or three decades in the oldest of the mineral industries. The demand for materials that can withstand extreme heat has resulted in the appearance of new products. The development of miniaturized-electronic and piezoelectric equipment only one-tenth the weight of standard equipment has been of great value in missiles and space vehicles. These items have been made possible by the use of new ceramic materials.

Referring to the scarcity of pure kaolin and other high-grade clays in Canada, the author stated that with the availability of new equipment and procedures there is now a new opportunity for research on the beneficiation of these clays to render them fit for uses for which they are not now suitable.

Determination of the Magnetite Content of Asbestos by Magnetic Separation by M. S. Badollet and N. W. Edgerton of Johns-Manville Research Center, Manville, N. J., described a method for measuring the magnetite content of asbestos fiber by removing it from an aqueous slurry of the fiber by strong magnets. The effectiveness of the method depends on having a complete separation of magnetite and fiber. It is impeded by the tenacity with which the fiber clings to the magnetic particles.

Russian Mining Review Professor H. R. Rice, head of the department of Mining Engineering, University of Toronto, in an address, *Vignettes of Russian Mining*, presented before the Metal Mining Division, gave a summary of the impressions he gained while in Russia for 3 weeks in May-June, 1960, as a guest lecturer of the Soviet Academy of Science. The growth of the mineral production in Russia between 1950 and 1959, he said, was greater than the rate of growth in other parts of the world.

Much attention is paid to the organization of the scientific services, including the education of mining engineers. More than 2,000 mining engineers are graduated each year with the equivalent of our bachelor's degree, and 40,000 geologists are engaged in mineral exploration. Professor Rice is of the opinion that the Soviet system produces many very highly specialized engineers.

New Officers At the business meeting of the Industrial Minerals Division, H. M. Woodroffe of the Mines Branch, Ottawa, was elected chairman for 1961-62, succeeding J. E. Whimster. J. S. Ross, also of the Mines Branch, was elected secretary-treasurer. Prominence was given to the plans for the joint meeting in Ottawa on October 2 and 3, 1961, with the Industrial Minerals Division of the American Institute of Mining, Metallurgical and Petroleum Engineers.

In his address as retiring president, W. H. Durrell told members of the institute that Canada will continue to need foreign capital to finance the development and operation of large new mining ventures. This is exemplified in the iron ore developments in Quebec and Labrador, he said. This industry would not have progressed without capital from outside. Present exports of minerals in Canada amount to about $2 billion annually, or about 42 percent of the total exports. This is a 124 percent increase since 1950, Mr. Durrell stated.

The president-elect of the institute is Dr. J. B. Mawdsley, M.B.E., chairman of the geology department at the University of Saskatchewan. Dr. Mawdsley brings to his new office many years of experience in the mining industry in the fields of geology and education.

Honors and Awards Major institute honors were presented at the banquet. The Selwyn G. Blaylock Medal, awarded for distinguished service to Canada through exceptional achievement in the field of mining, metallurgy, or geology, was presented to Ronald R. McNaughton, manager of the metallurgical division of the Consolidated Mining and Smelting Company of Canada, Limited, at Trail, B. C. Mr. McNaughton is currently president of the American Institute of Mining, Metallurgical and Petroleum Engineers.

The Medal of the International Nickel Company of Canada, awarded as a mark of distinction and recognition for a meritorious and practical contribution of outstanding importance to the mining and metallurgical industry of Canada, was presented to J. U. MacSwan, chairman of the department of metallurgical engineering at McGill University.

A well attended luncheon meeting of the division was addressed by Denis Harvey, Assistant Deputy Minister, Department of Trade and Commerce, Ottawa, who spoke on the work performed by Canadian Trade Commissioners in assisting Canadian world trade.

A.I.E.E. Meeting

(*Concluded from page* 101)

many, was read by R. J. Jager (Lone Star Cement Corp.).

DISTRIBUTION

The session on distribution was moderated by E. E. Wilkens (Nazareth Cement Co.). Papers presented included the following: *Progress Toward Recommended Practices for Cement Plant Power Distribution,* by A. C. Lordi (Westinghouse Electric Corp.); *What Is Interrupting Capacity, and Why Is It Important in Cement Plants?,* by L. E. Swanson (Peerless Cement Div.) and S. E. McDowell (Allis-Chalmers Mfg. Co.); *What Should Be Included in Specification Writing for Electrical Contractors for Cement Plant Use?,* by R. C. White (Macdonald Engineering Co.) and G. R. Bock (Diefenderfer, Inc.); *Considerations of the Power Distribution System for Starting Motors in Cement Plants,* by T. M. Ho (Kaiser Engineers) and Harold Robinson (Westinghouse Electric Corp.); and *Interesting Features of the Electrical Equipment at Dundee Cement Co.,* by J. A. Allan (St. Lawrence Cement Co.).

All of the above technical papers were bound in a single brochure, and copies were distributed to registrants at the meeting. (Copies of these papers may be obtained by contacting the treasurer of A.I.E.E., 33 West 39th St., New York, 18, N.Y.)

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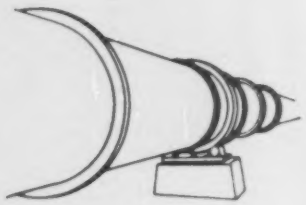

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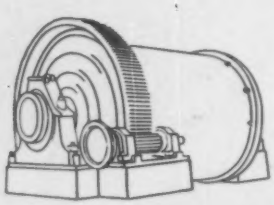

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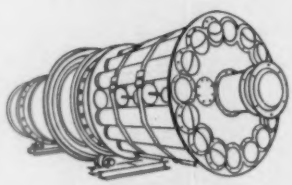

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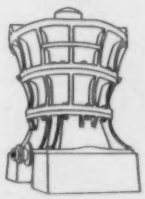

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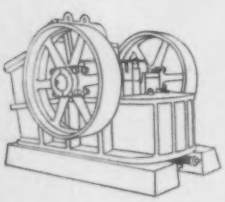

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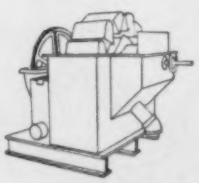

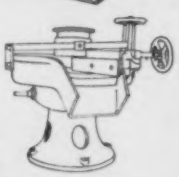

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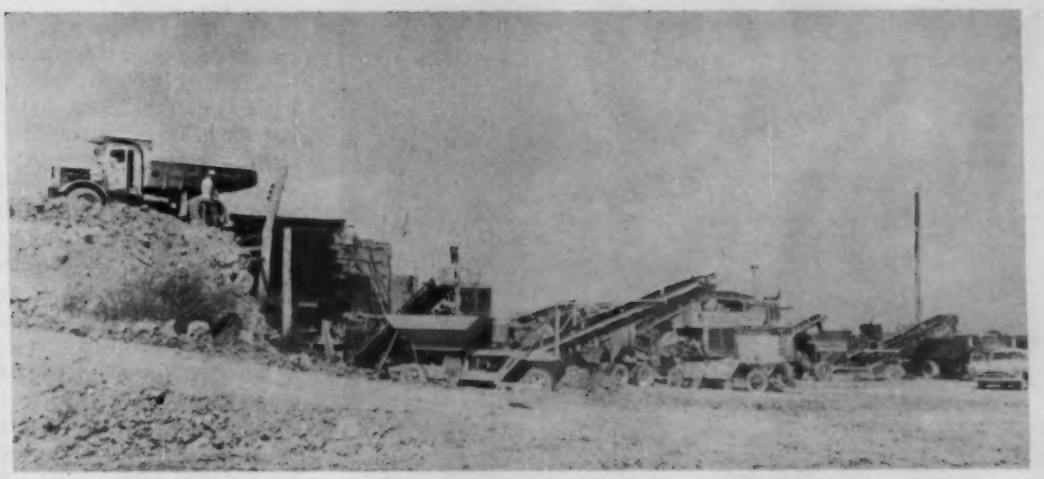


Equipment seen in this view, plus another portable secondary plant, is used to process material in four separate Kaser quarry locations. The installation shown here is at Red Oak, which also serves as headquarters for the multisite operations.

Iowa Producer Keeps on the Move

• Portable equipment meets varied conditions in serving wide area from several quarry sites

By BUREN C. HEROD

ANOTHER ON THE SPOT report

AS A leading aggregate supplier and road contractor in southwestern Iowa, Kaser Construction Company, Des Moines, finds it advantageous to operate any of a number of quarry sites which may be most convenient to a given project. In view of the fact that the company utilizes at least 15 locations for extraction of raw material, the economy of using portable equipment is obvious.

The diversity of conditions which could be expected in operating from time to time at the various points also dictates that the processing equipment must, in addition to being portable, be able to handle a variety of raw material characteristics.

Kaser's operations at Red Oak are typical with respect to methods and also represent some of the most difficult quarrying problems which may be encountered. This site also constitutes headquarters for this area of Kaser's operations, which include three other quarry locations. (Turn page)

In the drilling operations, from 80 to 100 holes may be sunk for a given shot. The background of this view gives an idea of the heavy overburden above the stone.

Another quarry view, showing the benching. Overburden above the top ledge averages about 70 ft. in thickness. Between the two ledges of stone used to feed the plant is a 2-ft. stratum of shale which must be removed.

From this upper ledge, broken stone is loaded out with a ¾-cu. yd. machine. A companion 1-cu. yd. shovel operates from the lower ledge. The haulage truck bodies are company-fabricated.

The Red Oak quarry, however, presents the most difficult problems —unusually heavy overburden ranging up to 100 ft. deep, and averaging about 70 ft.; intermittent shale strata; artesian water; and clay pockets in the upper section of the main formation. Despite these difficulties, the operation is turning out over 300 t.p.h. of specification material from 2½-in. to agstone.

Every piece of equipment used at Red Oak, from quarry to loading, is portable, including the primary crushing and the two secondary crushing and screening plants. The latter, when set up at this location, are installed centrally on the east side of the quarry area, which runs north and south on its long axis.

Beneath the overburden, the strata encountered from top to bottom in the present exposure consist of a 2-ft. layer of caprock, 4 ft. of shale, 8 ft. of limestone, another 2 ft. of shale, and the current lowest stratum of 12 to 13 ft. of limestone. Although the upper levels of stone contain solution channels and pockets filled with clay, the deposit improves in quality with depth.

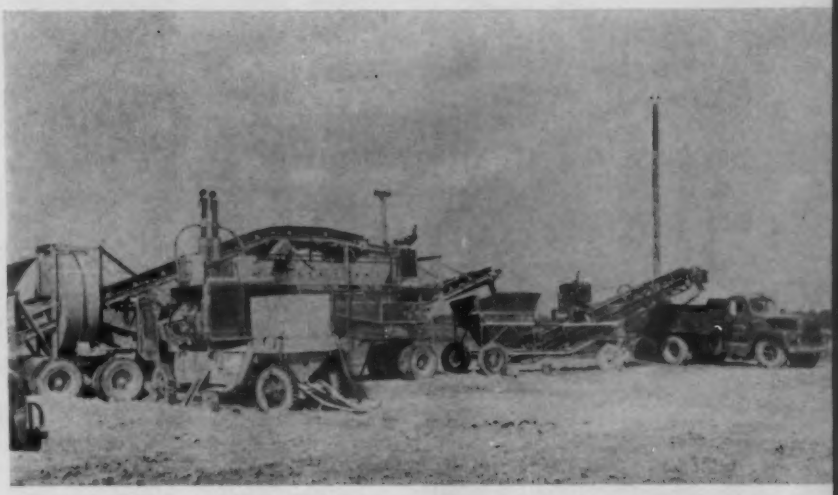
The overburden is stripped considerably ahead of the working area with twin Euclid scrapers. As seen in an accompanying quarry view, a large area of the caprock and upper shale are excavated ahead of the faces on the two main ledges being worked.

Blasthole drilling operations involve an Ingersoll Rand wagon drill and a companion Gyro-flo compressor. In normal procedure, from 80 to 100 holes, 2½ in. in diameter and on a 5- by 9-ft. spacing, may be sunk for a given shot. Drilling rates average about 1½ ft. of hole per minute, and yield is about 2½ tons of stone per lb. of explosive.

Stone from the lower ledge is loaded out by a 1-cu. yd. LS98 Link-Belt shovel, and from the upper by a ¾-cu. yd. LS88 machine. Quarry haulage is handled

Left: The primary plant is a portable feeder-impactor combination. Clay and shale, when present in the plant feed, is found in the minus 2½-in. range; this material is removed by the feeder from the flow to the crusher.

One of the two portable secondary plants. At left is one of the twin-diesel portable power plants furnishing drive for the secondaries. One of the portable hopper-loading conveyor units is at the right.



by three R190 International trucks fitted with company-fabricated rock bodies, and a pair of 12-ton Eucs.

At the plant feed hopper, quarry-run stone is delivered to a primary unit which was installed to overcome the problem of clay and shale in the feed. The portable primary is comprised of a 16-bar (9-in. pitch) Wobbler feeder followed by a 3645 Universal Impact Master with drive provided by twin GM diesels.

About 25 percent of the quarry-run material is minus 2½ in., and this range contains most of the clay and shale when these are present. The feeder is responsible for removing that fraction from the flow to the primary crusher.

Much of the time the minus 2½-in. material is clean enough to meet specifications and is carried with the primary crusher-run to the secondary plants. When it will not, it is discharged from the hopper below the feeder to a portable side conveyor for waste handling.

The primary plant delivers a 2½-in. top size product to the following secondary plants. Both of the latter are portable Iowa Manufacturing units, one incorporating a roll crusher, and the other a hammermill. Placed side by side for simultaneous operation when desired, each of them receives half the flow from the primary in a split feed.

When both Cedarapids plants are operating, the roll secondary is utilized primarily for production of 1¼-in. road rock and agstone, and the hammermill unit in producing ¾-in. material and agstone. Only rarely are they set up to deliver the same product range. The roll secondary is also used exclusively in making chips, a premium product utilized in asphalt paving.

Both secondary plants are diesel-driven by twin GM units on independent portable chassis, as seen in an accompanying view of the roll secondary. Single diesel engines provide the drive for the screens. Products are removed by portable conveyors which are powered by International diesels.

Due to the relative ease of moving around among the four quarry locations in which the equipment above is operated, these plants have delivered annually an average of 300,000 tons of material. Art Bolton is superintendent of the 18-man crew which operates the quarries at Red Oak, Tabor, Stennet, and Grant.

Basic production is in 1¼-in. road stone, but up to 14 percent of the output is marketed as agricultural limestone. In addition to supplying commercial customers, the operations in this part of Iowa also supply Kaser's requirements for sub-contracting and its own construction contracts.

Over-all management of Kaser Construction, with headquarters in Des Moines, is headed by Don Kaser, president, E. L. Kaser, vice-president, and E. T. Thorpe, vice-president.

1st Qtr. Marquette Net Gain Reported Up from 1960 Qtr.

Marquette Cement Manufacturing Company's net income for the quarter ended March 31, 1961, was reported at $669,618 or 19 cents per common share on receipts of $10,354,684. For the same period last year, net income was $405,187 or 14 cents per common share on receipts of $6,079,298.

Marquette's president, W. A. Wecker, pointed out that this is the first of the company's reports to include the operations of the plants of North American Cement Corporation and Green Bag Cement Company acquired early this year by Marquette. However, it does not include combined financial figures for 1960 for comparison.

In comparing physical volume, the combined figures for last year were used. On this basis, orders booked during the first quarter of 1961, including carryover, were 16.5 percent behind those for the same period last year, but shipments were 14.5 percent ahead.

Plans for the construction of a $2,000,000 plant south of Kingston, N. Y., have been announced by spokesmen for the New York Trap Rock Corporation. The major product of the new facility will be lightweight aggregate.

Fritz Leffingwell, president of the National Bituminous Concrete Association, has announced that the midyear meeting of this association will be held from July 23 to 26 at the French Lick-Sheraton Hotel in French Lick, Ind.

Mineral occurrence, exploration, processing developments on agenda of A.I.M.E.'s

S. W. Mineral Industry Conference

By HARRY F. UTLEY

ANOTHER ON THE SPOT REPORT

TOPICS of interest to the industrial minerals industry, ranging from exploration and development through processing techniques, were reviewed and expounded in three separate sessions during the two-day Southwest Mineral Industry Conference of the American Institute of Mining, Metallurgical and Petroleum Engineers, held in Las Vegas, Nev., on April 24 and 25.

The gathering attracted about 450 registrants (including more than 100 ladies) — Westerners for the most part—to meeting headquarters at the Stardust Hotel. This conference, sponsored by the Nevada Section of A.I.M.E., drew participants from the Southern California and Los Angeles Sections of A.I.M.E.; the Industrial Minerals Division, Society of Mining Engineers; and the Southern California A.I.M.E. Metals Branch.

Victor Howard, Basic Management, Inc., was general chairman of the conference. Chairmen of the three Industrial Minerals sessions were C. F. Clausen, Portland Cement Association; Dr. Frank Hunter, International Mineral & Chemical Corporation; and R. H. Feierabend, Freeport Sulphur Company.

Double-Cyclone Preheaters

A new development in double-cyclone preheaters ahead of the kilns which provided an intriguing topic was presented by Ray R. Adams, president of the Phoenix Cement Company. While recognizing the heat-exchange value of various established preheating systems which may be just as efficient in heat exchange between air and solids suspended in air, the speaker stated that the double-cyclone arrangement offers considerable advantage in space requirements and a saving in insulating values.

The idea of stacking cyclones within themselves is not in itself new, but its application to the cement industry has never been tried before. Work on the idea of using flash heat exchange was initiated about ten years ago by Howard Starke, technical director, and John M. Sauer, division superintendent, Riverside Cement Company. F. L. Smidth & Company participated in the development and design of the present double-stage preheater.

The first installation was made in 1958 at the Oro Grande plant of Riverside. However, before a try-out had been made at Oro Grande, the system was incorporated in the design of the Clarkdale, Ariz., plant of the Phoenix Cement Company. Construction of the Clarkdale plant began in June, 1958, and the kilns began operating in October, 1959. The most recent installation is in the new plant of the Hawaiian Cement Company. (All three of these companies are divisions of the American Cement Corporation, or owned in part by this firm.)

Left: Ray R. Adams, president of the Phoenix Cement Company, described the new double-cyclone preheaters used at the Clarkdale and Oro Grande cement plants of his firm and outlined some of the problems met and solved during the development of the equipment.

Right: Permanente Cement Company's 8,500,000-bbl. plant near Santa Clara, Calif., requires more than 2,000,000 tons of limestone annually. Dr. Donald Towse, project geologist of the company, described the deposit and outlined current and future processing developments.

The A.I.M.E. conference took top billing at the Stardust Hotel in Las Vegas, Nev., on April 24 and 25. Sessions were held in the auditorium of this hotel. In the background is the Stardust Hotel on the famous Las Vegas "strip," where most of the 425 registrants were quartered.

In this process a flash heat exchange is applied between the hot kiln exit gases and the cement raw mix in dry-process operations. The exchange is effected in cyclones, one within the other, and then dropped out of suspension. Mr. Adams explained that the duct from the kiln is castable-refractory lined, as is the outer cyclone. The inner shroud and cyclone are heat-resisting stainless steel.

The path of the gas is up a vertical duct through the shroud and into the inner cyclone, where it first meets the kiln feed. Feed introduced into the inner cyclone is partially heated. It then drops down a chute into a vertical duct, where it is reentrained and carried into the outer cyclone. Here, about 90 percent of the pre-heated feed material is recovered and allowed to enter the kiln *via* the feed pipe.

The remaining 10 percent of the feed in the gas stream is first scalped off mechanically (by Buell cyclones at Clarksdale and by Cyclotrells at Oro Grande), and final cleanup is effected by glass-cloth bags at Clarkdale and by electrostatic precipitators at Oro Grande. The catch from the bags is returned to the kiln, while at Oro Grande a part of the final collection is discarded because the alkali content inherent in the raw material is too high.

A Buffalo fan driven through a fluid coupling by a 500-hp. motor provides up to 15-in. water-gauge pressure drop across the entire system. (The normal drop is about 10 in.)

There were numerous problems to be solved, however, before the system became commercially workable, Mr. Adams reported. "In the interest of a more consistent operation without periodic shutdowns for clean-out in the throat of the vertical duct, we experimented with temperatures in the duct, finding that the maximum temperature of 1,200 deg. F. showed very little buildup of troublesome feed material at this point. Consequently, a spray was introduced which reached into the back end of the kiln to reduce the temperature to 1,200 deg. F. or less."

"As we rid ourselves of overburden material in our limestone at Clarkdale, alkali conditions improved, going from 0.7 percent down to about 0.4 percent in the finished product. Since then we have cautiously added back the catch from the bag-house and are withdrawing the use of constant water sprays introduced to hold the temperature down. It is too early now to assay the results of the move, but presumably we will obtain a higher efficiency through the system.

"This early high-alkali content had another relative effect, inasmuch as the cake on the inside of the dust-collecting bags with the high alkali was difficult to remove and sometimes resulted in the bags not cleaning themselves completely in the reverse-action collapse. This condition was helped by consultation with other users of this type of installation, the most effective remedy coming from the Ideal Cement Company. This (method) consisted of installing a rotating damper within the duct of the back suction fan.

"Another problem was fluctuation in feed, which upset the balance not only in the preheating area but also burning temperatures and flush conditions within the kiln proper. When these fluctuations were ironed out, both these conditions were greatly remedied. We feel now that only minor refinements in the system will be necessary, step by step, to effectuate further heat conservation, resulting in lower B.t.u. requirements for the burning operation."

Limestone Deposit at Permanente

Dr. Donald Towse, project geologist of the Permanente Cement Company, described the interesting deposit at Permanente, 10 miles west of San Jose, Calif., which supplies all the limestone for the Permanente cement plant nearby. Stone from the deposit was quarried for beet-sugar manufacturer as early as 1907, and the cement plant was built by Henry J. Kaiser and his associates in 1939. Full 8,500,000-bbl. capacity of the plant requires the production of over 2,000,000 tons of cement rock annually, and the removal of a large quantity of waste.

This deposit is a complex faulted block of the Cretaceous Calera

limestone in sediments and volcanic rocks of the Franciscan Series lying along the east edge of the San Andreas fault zone. The limestone is divided into two units: an upper "white" medium-grade stone and a lower "blue" high-grade. Both have variable and discontinuous beds of chert which cause the composition to vary considerably.

The deposit is limited by a major sole fault and is broken into major fault blocks by a number of high-angle relief faults. Continuing studies of the deposit are being made to plan future developments to meet increasingly rigid cement specifications. Air rotary drilling is used for both blast- and exploratory-hole drilling, and ammonium-nitrate explosives are employed. A conveyor system carries stone of various grades for blending from the primary crushers at the quarry loading point to the cement plant stockpiles 5,600 ft. distant.

Dr. Towse revealed that plans have just been completed for the early installation of different-grind and flotation equipment to beneficiate medium-grade limestone by the removal of the chert.

California Asbestos Exploration In a paper by Salem J. Rice of the California Division of Mines, *Recent Exploration for Asbestos in California* was outlined. Although California has a large outcrop area of serpentine, the "host rock" for chrysotile, asbestos production in the state has been small, sporadic, and largely of the amphibole variety. Serpentine crops out abundantly in the Sierra Nevadas, the Coast Ranges, and the Klamath Mountains.

During the recent activity most of the previously known chyrostile deposits have been re-examined, and several new sources have been discovered. Among the latter, one of most interesting is a very large and unusual deposit in the New Idria mining district in San Benito and Fresno counties. Other recently discovered deposits are all of the cross-fiber type.

Two asbestos milling plants, both small, were constructed in 1960 near deposits in Napa and Fresno counties. These developments, along with promising exploration results at other deposits, lead Mr. Rice to believe that a significant asbestos-mining industry may be in store for California.

So. California Limestone Resources Immense reserves of limestone occur in southern California in terranes of metamorphic rocks of the Precambrian, Paleozoic, and Jurassic-Triassic ages. They range from dark blue-gray to white, and from fine to coarsely crystalline. These deposits provide the raw material for a major segment of the mineral industry in southern California, including the manufacture of portland cement, chemicals and fillers, lime, flux, glass, terrazo chips, and roofing granules.

In a paper describing these resources, Cliffton H. Gray Jr., California Division of Mines, reported that in general only those deposits within a 100-mile radius of the Los Angeles market area have been extensively developed. Most of the closer deposits are held by long established operators and there is little likelihood, in Mr. Gray's opinion, of the discovery of significant new deposits within this area. Moreover, strong opposition to new plants and quarries, or even the expansion of present plants, is voiced by influential residential property interests.

Industrial Minerals in Rocky Mt. Areas Industrial minerals development in the central and southern Rocky Mountain regions were described by Alfred L. Ransome, U. S. Bureau of Mines, Denver, Colo. About 30 of the 50 recognized industrial minerals occur either in commercial quantity or as known resources in Arizona, Colorado, New Mexico, South Dakota, Utah, and Wyoming. Certain of these, including beryl, perlite, rare earths, pumice and native bitumens (gilsonite), generally are not found elsewhere in commercial quantities.

In addition to industrial minerals, either in production or having a record of past production, there are resources of these commodities known but undeveloped in the six-state mountain region. Growth and eventual utilization of these deposits is a function of two basic factors—population and technological advances. Inasmuch as the upward trend in these states is unmistakable, Mr. Ransome believes there is every reason to expect a parallel development of these resources.

Alaskan Mineral Resources Industrial minerals occurring in Alaska were summarized by John Y. Cole of the Kaiser Gypsum Company, Oakland, Calif. Except for coal, there are few operations commercially under way in the 49th state. There are, nevertheless, potential resources of asbestos, mica, sulphur, barite, pumice, gypsum, phosphate, and a wide range of other nonmetallic minerals in Alaska which may some day provide an important backlog of reserves for this country, he reported.

Nevada Brucite-Magnesite Brucite-magnesite developments at Gabbs, Nev., were reviewed by Augustus M. Dixon, of Basic, Inc. Brucite was discovered in the Gabbs area in 1927, and magnesite was recognized a short time later. It was estimated by U. S. Geological Survey investigators in 1933 that the reserves amounted to several million tons of magnesite ore. In 1937 Basic Ores started production of brucite. Basic Magnesium, Inc., was organized in 1941, and production of magnesium oxide began in 1942 and ceased in 1944.

In December, 1950, a rotary kiln was placed in production by Basic Refractories, Inc., with a capacity of 80,000 tons of refractory clinker annually. Two years later (1952) Standard Slag Company installed a 35,000-ton-per-year rotary kiln and appurtenant equipment. The latest development was the completion in the fall of 1960 of a second kiln by Basic, Inc. (successor to Basic Refractories), with a capacity of 40,000 tons annually.

Talc Production in Death Valley Richard H. Franklin of the Grantham Mines talc operation on the west side of Death Valley in California, traced talc developments in the valley and described current operating practice. The deposits were located in the early 'thirties but first shipments were not made until 1942. Production has since gone up steadily with the demand and now runs in excess of 100 tons daily.

The deposits were first mined from an adit, using a modified room-and-pillar method. Open stopes were driven up dip from one level to another, and the talc was slushed into small mine cars. These cars were hand-trammed to a winze, hoisted by air to the portal level, and hand-trammed to surface storage bins.

Conversion to trackless mining began in 1955, when diesel-powered rubber-tired front-end loaders were introduced to load the blasted material into pneumatic-tired trucks, which haul over inclined roads.

Barite Production in California

A recent examination of the principal barite-producing areas in California was outlined in a paper by Harold Weber Jr., California Division of Mines. Most of the barite has been coming from two deposits, one in Nine-Mile Canyon in Tulare County, the other in San Bernardino County.

Deposits in the Nine-Mile Canyon region occur in two segments of what may be a single zone of metamorphic rocks, separated by granitic material. Deposits in the Calico Mountains consist of veins of barite in Tertiary rocks which were once worked for silver. Future important sources of barite may be such operations as the Mountain Pass rare-earths mine in San Bernardino County, and perhaps the metal mines in the Shasta copper-zinc district and the gold workings in the Sierra Nevada, according to Mr. Weber. He also mentioned significant new applications for barite, which include its use as aggregate in high-density concrete to shield atomic reactors, and as an additive with rubber to asphalt mixes in the construction of rubberized asphalt pavement surfaces.

Don't blindfold him!

THE AWESOME-looking instrument in the picture above is an electron microscope. Through it, a cancer researcher can observe the detail of a cancer cell—magnified 100,000 times.

The microscope costs $35,000 and was paid for by American Cancer Society funds—which support 1300 scientists, all working to find the cause of cancer, and its prevention.

Don't blindfold cancer research. Give to it. Send your contribution to CANCER, c/o your local post office.

AMERICAN CANCER SOCIETY

Material Service Operation To Pioneer Tube Cooler Use

This summer, an application of integral tube coolers, reportedly the first in the lightweight aggregate field, will be made in the Material Service expanded shale producing facilities at Ottawa, Ill. The addition of this third kiln will increase production by over 50 percent of Material Service's trademarked product, Materialite. It will also reportedly make the firm the largest producer of lightweight aggregate.

Plans call for the installation of an Allis-Chalmers 11-ft. 3-in. by 200-ft. kiln with ten 4½-ft. diameter by 20-ft. long Warner tube coolers. The new kiln will be fabricated from an existing 120-ft. rotary dryer and a new 80-ft. section.

Advantages for the integral tube coolers are said to be increased efficiency, conservation of space, and lower construction costs because no supporting piers are required.

The Portland Cement Association safety award was given to the Giant Portland Cement Company at a recent dedication ceremony at the company's Harleyville (S.C.) plant. The award was for a total of 428,380 man-hours of work without a disabling injury during 1960. The work force numbers 214.

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• If you don't know the answers, this article will tell you. If you *think* you know, this article will test your knowledge. This is a brief and concise guide to help you stay in business—and out of trouble.

WHAT IS *your business law I. Q.?*

By G. T. MEDLOCK
Attorney at Law
Member
U. S. Supreme Court Bar
and
R. D. STEVENS
Management Consultant

HOW much business law should you know? This is a difficult question to answer, but every management executive in the nonmetallic minerals industry should remember that business law governs the everyday activities of his company, perhaps more than he may realize.

Of course, you should not attempt to be a lawyer. But you can know how the law protects you, your company, and the other person. It takes only one legal error in your company business dealings with other people to lose money. A working knowledge of business law can therefore be very important to you. The nature of this responsibility and the actions essential to its discharge constitute your management doctrine. It is not a substitute for legal advice. It is intended, rather, to augment the training, experience, and judgment you use concerning a sound business managerial approach to problems.

Business law is a body of principles and knowledge which you can use to increase the economy and efficiency of your company. Handling business law problems is not a simple subject. It requires knowledge, training, and experience. But there is no reason why you cannot become an expert on your rights under business law. By acquiring such information you will be able to handle your company problems more efficiently and economically without racking your brains about possible legal pitfalls.

Learn what business law is about. Protect yourself and your company by knowing your legal rights and avoiding legal mistakes. Have one unbreakable rule about business law—when in doubt, consult with your company lawyer.

SELF-TESTING CHART

The following check list will give you some idea of how much you know and understand about business law. It will also point out areas of knowledge in which you should improve. To get a quick knowledge of business law subjects, answer the following questions; then check the answers.

TO SCORE YOURSELF, TURN TO PAGE 120

QUESTIONS ON BUSINESS LAW

1. What is the origin of the word "law"?
2. What is the English common law?
3. What is the supreme law of the land?
4. When was the Federal Constitution put into effect?
5. Must acts of Congress conform to the Constitution?
6. What is meant by statutory law?
7. What is administrative law?
8. What is tort law?
9. Who is a plaintiff?
10. Who is a defendant?
11. Describe a contract.
12. What are the essentials of a contract?
13. What types of contracts must be in writing?
14. Who has rights under a contract?
15. How may a contract be terminated?
16. What is the nature of an agency relation?
17. How is an agency relation created?
18. What are the duties of an agent to the principal?
19. What are the duties of a principal to the agent?
20. What types of agents are there?
21. How may the authority of an agent be described?
22. Is an agent liable to a third party?
23. How may an agency be terminated?
24. How is landlord-tenant relationship created?
25. What are covenants?
26. What is a landlord called?
27. What is a tenant called?
28. May leased property be assigned or subleased?
29. How may a lease be terminated?
30. Describe a sale.
31. What is a contract to sell?
32. When does title pass?
33. What are warranties?
34. Does a seller have a remedy for breach of contract?
35. Does a buyer have a remedy for breach of contract?
36. What are negotiable instruments?
37. Describe types of negotiable instruments.
38. Who is a holder-in-due-course?
39. What is a check?
40. When must a check be presented?
41. Describe a partnership.
42. How is a partnership formed?
43. What is partnership property?
44. What are the rights and duties of partners?
45. How is a partnership dissolved?
46. Describe a corporation.
47. How is a corporation formed?
48. What is a charter?
49. What are by-laws?
50. How may a corporation be financed?
51. What is the policy-determining body of a corporation?
52. What are the stockholders' rights?
53. Can a woman operate her own separate business?
54. What is the relation of the Federal Government to interstate commerce?
55. What rights do employees have in regard to organizing?
56. What is meant by due process of law?

ANSWERS APPEAR ON PAGE 120

For jet runways and high speed turnpikes . . .

SYMONS® CONE CRUSHERS

produce big tonnages of quality construction materials at low cost per ton

Symons Cone Crushers are built in Standard, Short Head and Intermediate types with crushing heads from 22" to 10' in diameter, in capacities from 6 to over 1500 tons per hour. Shown above is a typical Symons Cone Crusher installation, producing large tonnages of quality aggregates.

At left is a view of the Fort Worth Interchange, on the Dallas-Fort Worth Turnpike. The inset view shows a jet taking off from one of the modern concrete runways at Chicago's O'Hare International Airport. These are but two of the many examples of the contributions being made by the construction industry in the interest of improved transportation.

Construction for today's transportation needs is highly competitive big business. Competition these days is rough . . . bids must be kept low. More often than not, profit depends on equipment you can rely on for day-after-day output of high tonnages of specification material at low per-ton cost.

Symons Cone Crushers meet these demands for production at a profit. Their unequaled record for consistent dependability under the toughest crushing conditions, low maintenance costs, and high capacity production of finely crushed construction materials is known to contractors, operators and engineers all over the world.

Available for stationary, portable and semi-portable service, Symons Cone Crushers—like all Nordberg machinery and equipment for the construction industry—have become *first choice where maximum output at lowest possible cost is needed.*

SYMONS . . . *a registered Nordberg trademark known throughout the world.*

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Business Law I.Q.

(*Concluded from page* 117)

ANSWERS TO BUSINESS LAW

1. Scandinavian; related to *lay (lie);* a law is that which is *laid,* set, or fixed.
2. Developed mostly out of the customs and traditions of the English people.
3. The Federal Constitution.
4. 1789.
5. Yes.
6. Enacted either by the Congress or states.
7. Rules and regulations of federal agencies.
8. From Latin *torquere* (to twist or wrench aside)—a private or civil wrong or injury.
9. A person who brings an action (complaint or suit) in a court of law or equity.
10. The party against whom relief (or recovery) is sought, as opposed to a plaintiff, defined above. A defendant denies, or defends.
11. "A promise or set of promises for the breach of which the law gives a remedy, or the performance of which the law in some way recognizes as a duty." *Restatement of Law of Contracts.*
12. The parties must have a legal capacity to contract; there must be an offer and an acceptance; there must be reality of consent; sufficient consideration must be given; and the contract must be in proper form and have legal objects.
13. Contracts of executors/administrators who become personally responsible for the debts of the estates they are administering; contracts involving sale of real estate; contracts to answer for the debt, default, or miscarriage of another; agreements that may not, under their terms, be performed personally within one year; and agreements to sell personal property above a certain amount, usually $50, unless there has been part payment or part delivery.
14. Only the parties to a contract have any rights and duties under it. All rights under a contract may be assigned, without consent of the other party, unless contract is made non-assignable by its terms.
15. By performance, agreement of both parties, impossibility of performance, or operation of law.
16. Authorities agree that an agency exists wherever one person acts for another, *by the latter's authority.*
17. By contract, ratification, necessity of emergency, conduct of the parties, and operation of law.
18. The duty of loyalty; obedience to reasonable instructions; use of care and skill; informing the principal and accounting to him.
19. The duty of compensating, reimbursing, and indemnifying the agent.
20. General and special agents.
21. Authority may be actual, apparent or ostensible, express or implied, or emanating directly from the principal himself.
22. An agent is liable for what he does on behalf of his principal, whether such principal is disclosed or undisclosed; and he makes his principal liable for his acts, contractual or otherwise, when he acts within the scope of his (the agent's) authority.
23. An agency is terminated by agreement of parties, by forced ceasing of work (firing), by closing of business, or by death of principal or agent.
24. By a contract, which is a lease.
25. They are like deeds, containing implied and express provisions.
26. Lessor.
27. Lessee.
28. Yes; but a landlord usually inserts a provision in the lease (contract) that the tenant may not do so without his consent.
29. By notice, surrender, forfeiture, eviction, or expiration of term of lease.
30. An agreement whereby the seller transfers the property in goods to the buyer for a consideration, called the price.
31. An instrument whereby the seller agrees to transfer the property in goods to the buyer for a consideration, called the price.
32. The general rule is that title passes whenever the parties agree that it shall pass.

SCORE BOX

Here's how to rate your answers—Find your rating below:

100 points—perfect (very rare); 75 points — Good (above average); 50 points —Fair (average).

Below these points—Unsatisfactory.

33. Any affirmation of fact or any promise made by the seller relating to the goods is an express warranty if the natural tendency of such affirmation or promise is to induce the buyer to purchase the goods, and if the buyer purchases the goods relying thereon. No affirmation of the value of the goods, nor any statement purporting to be only a statement of the seller's *opinion* shall be construed as a warranty. The law implies that the seller of goods makes certain warranties in his contracts even though such warranties were not actually or expressly made by him. The type of warranty implied in a given contract depends upon its nature.
34. An unpaid seller may exercise certain remedies against the buyer.
35. He may sue the seller for converting or detaining goods or for failing to deliver; and he may bring suit in equity for performance of contract.
36. A written request or promise for payment of any certain sum of money to the bearer or to order is termed a negotiable instrument.
37. Bills of exchange, drafts, and negotiable promissory notes.
38. A holder who has taken the instrument under the following conditions: it is complete and regular upon its face; he became holder of it before it was overdue, and without notice that it had been previously dishonored, if such was the fact; he took it in good faith and for value; at the time it was negotiated to him, he had no notice of any infirmity in the in-

strument or defect in the title of the person negotiating it.

39. A bill of exchange drawn on a bank payable on demand.
40. A check must be presented for payment within a reasonable time after its issue or the drawer will be discharged from liability thereon to the extent of the loss caused by such delay.
41. A contact between two or more persons who mutually agree to place some or all of their talents, labor, and capital into a lawful business, and to divide the profits or share the losses of that business in certain portions.
42. By a contract, if the parties have a legal capacity to contract.
43. All property originally brought into the partnership by the members, as well as property acquired with partnership funds, belongs to the partnership, unless a clear provision to the contrary is included in the contract.
44. The law imposes utmost care and confidence upon the partners in their dealings with each other. Each one has an equal right in management and conduct of business, compensation for services rendered as a partner, inspection and examination of books and records, sharing in profits and surplus; he also has a right to contributions and to be indemnified, and a right to an accounting.
45. By agreement of the partners, notice of dissolution, conviction of a partner on charges of felony, insanity of partner, extinction of business, death of a partner. Some states add other methods of dissolution.
46. A corporation is an artificial being, invisible, intangible, and existing only in comtemplation of law. Being the mere creature of law, it possesses only those properties which the charter of its creation confers upon it, either expressly, or as incidental to its very existence.
47. Certain requirements set out in the state statute must be met. Articles of incorporation must be prepared and presented to the Secretary of State. A fee must be paid, and, finally, a charter must be procured. All states have adopted this system of granting charters.
48. A grant of incorporation; a charter is the entire constitution of the corporation. It is also a contract between the state, the corporation, and its members.
49. Rules or regulations established for the general government of the corporation.
50. By getting people to subscribe for shares of stock, such as common and preferred. Stock sold in interstate commerce is subject to the SEC.
51. The board of directors. Acting collectively in a meeting, they have broad powers to set policies.
52. They have nothing to do with the carrying out of corporation policies. Stockholders have a right to vote, receive dividends, and inspect and examine books and records.
53. In most states a wife can carry on her business independently of her husband. She is entitled to the entire profits from it.
54. The Constitution provides that, "Congress shall have the power . . . to regulate commerce with foreign nations and among the several states, and with the Indian Tribes."
55. They may organize or refrain from all such activities.
56. When a matter is decided through courts, the result is due process of law.

American Edition Issued On Crushing-Grinding Manual

The first American edition of *Crushing and Grinding* (a bibliography) has been published and is now available. This work was originally published in England.

The bibliography is classified under the following headings: fundamental aspects, crushing and grinding practice, crushing and grinding equipment, coarse reduction, fine reduction, nonmechanical methods, materials, methods of particle size and surface area determination, classification, dust, etc.

Published by the Chemical Publishing Company, Inc., New York, N. Y.

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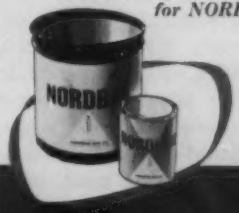
Here it is! NORDBAK . . . the manganese backing you pour at "room temperature." You simply mix the contents of two cans together and pour!

Field tests and on-the-job experience show that NORDBAK really works! Because it's resilient and non-shrinking, it provides excellent backing. It's so tough that in a prolonged test the manganese wore through in spots, but NORDBAK remained uncracked. It's easily removed at changeout, too. You can store NORDBAK at your operations . . . get a supply to keep on hand, ready for the next time you replace liners.

Call, wire or write your order for NORDBAK!



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Milwaukee 1, Wisconsin

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What does advertising really cost?

ADVERTISING EXPENDITURES and Your Income Tax

By HAROLD J. ASHE

WHEN volume is up, advertising too often is the last volume-creating factor to be increased; when volume is down, advertising is too frequently the first overhead item to be cut back.

Because of its volume-producing function, advertising should be the last business cost to be reduced, not the first, when trade is off. Moreover, if gross receipts are rising, there's a built-in need for increasing advertising outlays to sustain that rise and push it higher. Before attempting to practice economies through holding down or reducing advertising outlays, an operator should consider certain management facts.

Most business expenses are relatively fixed (if not absolutely fixed), such as occupancy, utilities, property taxes, and—within a narrow volume range—even wages and salaries. There is a high break-even point, above which there is a net profit and below which a loss occurs. Advertising, on the other hand, can be quickly stepped up or reduced, at a business taxpayer's option. Too often, this option is exercised to cut advertising costs, particularly by noncorporate taxpayers and principals in closely-held corporations.

Yet, productive advertising is the one indispensable factor in maintaining volume or increasing it. Without it, fixed cost-of-doing-business items may overwhelm a taxpayer.

Net Cost of Advertising, Adjusted to Reflect Income Tax Saving*

(Assuming cost if fully deductible at highest applicable tax bracket rate, not split between two or more rates)

Income Tax Bracket	Net Cost of Advertising Dollar
20%	.80
22%	.78
26%	.74
30% (individual or corporate)	.70
34%	.66
38%	.62
43%	.57
47%	.53
50%	.50
52% (corporate	.48

*Net cost does not take into account that productive advertising more than pays its way, and shows a profit. The purpose here is simply to reflect the income tax result to advertising outlays, unqualified by other considerations.

Reducing advertising outlays to offset the ill effects of a drop in volume may only help to accelerate the tempo of the decline. Likewise, failing to increase advertising outlays when favorable conditions prevail and volume is mounting will slow down the rate of the increase. It will result in a leveling off at a lower peak than might otherwise be attained if there were additional advertising "push."

Theory vs. practice—Even a taxpayer who has built a solid, profitable business on productive advertising may come to the conclusion that he can afford to ease off on his advertising and pocket the "savings." For a brief period of time, this theory may seem quite practical. In fact, he is reaping the final benefits of past advertising from customers initially developed by earlier advertising outlays. There will come a time, however, when the usual pace will slacken and then grind to a halt.

Losses and gains—Let us suppose a certain volume of business is being maintained by the expenditure of a certain percent of gross receipts for advertising. What happens when advertising is cut? A large part of that volume will be maintained because of such factors as location, good will, and other considerations. Above this minimum level, however, volume will very likely decline at the same rate as the cut in advertising. If advertising is cut one-third, an equally serious decline may occur in gross receipts, *above the bare minimal level already discussed.* With a high break-even point, all net earnings may disappear, making such an advertising "saving" a dubious one.

Advertising as a tax deduction—Advertising costs, ordinarily, are

fully deductible as a business cost in the year they are incurred. The result is that the government, as a silent partner for income tax purposes, is obliged to defray a part of the advertising expenditures. The government does this through a reduction in an individual or a corporate taxpayer's income tax bill. How much of this outlay the government bears, and what the net cost of the advertising is, depends on the tax bracket rate applicable to a taxpayer's adjusted gross income.

Example: A noncorporate taxpayer's adjusted gross income is $20,000 from all income sources, including his business. He is married, has five exemptions, takes the standard deduction, and files a joint return. He has $16,000 subject to income taxation, with $4,000 subject to the 30 percent tax rate. If he had expended, during the tax year, only another $1,000 in advertising, what would have been the income tax result? His adjusted gross income would have been reduced by $1,000. The income tax bill would have been reduced by $300, making the net cost of the additional advertising only $700.

Increasing profits to pay tax—In the foregoing example, no account is taken of the fact that an additional outlay of $1,000 for *productive* advertising would undoubtedly show up favorably both in an increase in gross receipts and in a substantially larger net earnings figure. (Because of fixed expenses, net earnings usually go up at a much faster rate than do gross receipts above the break-even point.) Thus, mounting profits attributable to increased advertising outlays will be sufficient to defray (1) income tax on these additional profits and also (2) a substantial part of the tax on other profits. The after-income-tax profits will be larger than otherwise.

Advertising outlays will not be an expense but will be a major factor in determining net earnings.

Taxes make more advertising imperative. Because of the impact of income taxes on a taxpayer's take-home net earnings more, not less, advertising is usually warranted. Only by increasing gross receipts and, in turn, net earnings is there any hope for a taxpayer to fatten after-tax take-home earnings. The fact that, as net earnings mount, he is permitted to keep a smaller and smaller fraction of net earnings, after income taxes, does not alter this imperative. Sharply graduated tax rates leave him no alternative.

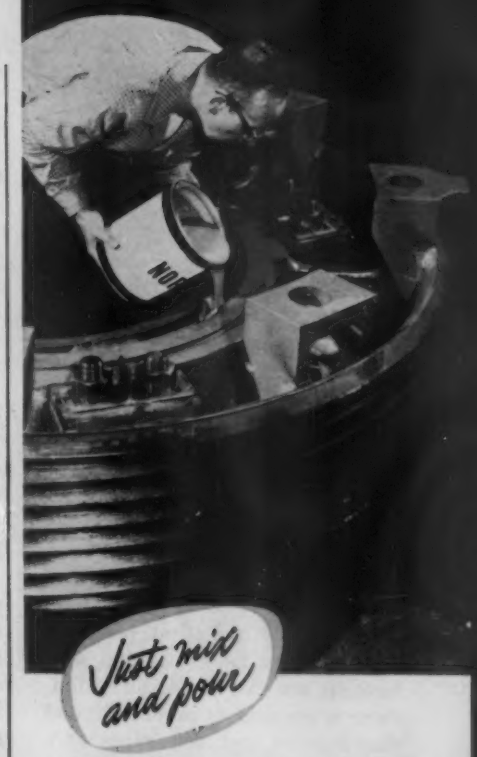
Long-range effects of advertising—As pointed out earlier, advertising expenditures are fully deductible in the year they are made, and they reduce that year's adjusted gross income and income tax bill. However, consistent, productive advertising has certain residual results that may be felt long after the advertising outlays were made. These continuing benefits may be substantial if current advertising backs up the advertising of earlier years.

Some old and valued customers may date back to advertising outlays made many years earlier. Their good will and continued patronage is a valuable business asset. If sufficient good will exists in a going business, this may result in a substantial gain when a business is sold. At worst, it may prevent a business from being sold at a loss, as so often occurs when ventures having little good will and only inventory and equipment seek a buyer.

What is more, the cost of building good will as a distinct business asset—having a cash value at the time of a sale—was recovered over the years in annual advertising and other costs. At the same time, the sum of money received for good will, if separately identified in a sales agreement (but not the amount given for a covenant prohibiting competition), is subject to low capital gain rates.

The Hercules Cement Company plant at Stockertown, Pa., recently resumed operations. It has been closed since December to permit installation of a $1,000,000 glass-bag dust collector.

The sand and gravel plant of the Roger H. Cowden Materials Company at West Carrollton, Ohio, was sold recently to Hilltop Concrete Corporation, Dayton, Ohio.



NORDBAK

It's Simple, Safe and Sure...

It had to happen . . . someone was bound to find a way to end the problems of backing manganese crusher parts with molten metal!

Now . . . you can do it with NORDBAK!

It's mixed at "room temperature" and poured right from a can into the crusher cavities. Gone is the need for special melting and pouring equipment . . . and gone are the hazards of pouring hot metal.

An initial, low cost order to back one set of crusher parts will prove the many advantages of NORDBAK *. . . call, write or wire your order today!*

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Sand, Gravel Transport by Rail...

*Soon to Be Only a Memory?**

By **CHARLES E. BRADY**
B. V. Hedrick Gravel and Sand Company
Lilesville, N. C.

IF you want figures to support the position that rail transportation of sand and gravel is swiftly becoming a memory, you can get reams of them by referring to the Bureau of Mines reports, and by reading the briefs presented in *Ex Parte* ICC hearings over the years. The main purpose of this talk is to assess the why's and wherefore's of this trend.

Practically the first lesson I learned about the gravel and sand business was that if you can't sell it, there is no need to produce it; and that delivery cost determines to a great extent *where* you sell it. So I learned how to figure freight rates —not just to determine our rate to a given point, but also to determine our competitor's rate. At one time I had an accurate mental picture of every railroad line in North Carolina, and knew the name and approximate location of every station, certainly every station having a siding big enough to take several carloads of sand and gravel.

In 1937, there were no large quarries or gravel plants (with the exception of a small quarry in Winston Salem) operating in North Carolina which were not located on railroads. Not only were all city needs for aggregates supplied by rail delivery, but practically all road building needs as well. The plants in North Carolina could be counted on the fingers of two hands.

A big reason for this small number was that there were no single areas using enough stone, gravel, and sand to sustain a profitable quarry operation, with the possible exception of several of the larger cities. Quarries and gravel and sand plants needed to draw their business from large areas in order to secure sufficient tonnage to justify their existence. Consequently, the railroads were fairly certain of all long-haul business, and in most instances had published special rates to secure and keep the shorter haul business.

Now there are many quarries and gravel and sand plants in North Carolina. . . . Few of these plants are located on railroads, and some of the old, so-called permanent railroad plants are closed down because of newly developed sites between them and the market. What happened to our business in such a relatively short time, to change it almost completely from rail transportation to truck transportation?

The foremost reason, I believe, is a double-barreled one—greatly increased volume of aggregate business, and lack of properly trained and informed personnel in the railroad industry to see and understand what was happening.

Although I keep referring to North Carolina, I don't believe other areas would be so different. In North Carolina, immediately after World War II, there was great need for aggregates to repair existing roads, then continued demand for building new roads as traffic flow steadily increased. It was also needed for building new schools, churches, homes, business establishments, industrial plants, sewage and water systems, and airports.

It was not uncommon for one project alone to require more tonnage than formerly would be sold by an aggregate plant in a year's time. Large tonnage jobs encouraged the opening of new aggregate plants located near the jobs. The equipment people meanwhile, recognizing the trend, began producing even more efficient and mobile crushing and screening equipment. It became practicable to keep a plant in a given location until demand was satisfied, and then to move the plant at relatively low expense to a new site.

It is easy to understand that when high transportation costs prevailed on large orders—say, $1 or more per ton f.o.b. railhead on 500,000 tons—someone . . . would begin to plan how he might open a plant near the job and pocket a good part of the difference in transportation costs, in addition to a profit on the aggregates produced.

Admittedly, even, if the railroads had recognized what was happening, and had reduced their rates sharply, they could not have stemmed the tide completely. However, the railroads were steadily resisting the efforts of the stationary producers who were trying to show that further rate raises would only lose them more tonnage!

In the last two years it appears that the railroads are beginning to be aware of what has happened to them. But they still do not have

Charles E. Brady

*Presented before a convention session of the National Sand and Gravel Association on January 24, 1961.

enough or the right kind of personnel to do the job to be done. Aggregate producers cannot always give enough of their time to inform the railroads of every competitive situation in which their interests could be served by taking informed action. The railroads need some alert salesmen, not chosen by the seniority method, to work closely with the few active producers still left on their lines. Together, such representatives and stationary aggregate producers can devise means of holding present markets, and of expanding into others.

The piggyback combination of truck and rail is an excellent example of how railroads, by exercising some flexibility and ingenuity, can get back business they have lost. Recently, too, I have seen flatcars arranged in tandem, so that their surfaces present an unbroken platform two autos high, and on them scores of new automobiles, again moving by rail to the new car dealer. The truck auto-carrier long ago outdated closed boxcar delivery, but 20 years were required for the railroads to determine how to fight back!

Most aggregate producers are convinced that the railroads are licked! For most railroads are convinced that aggregates move at a loss to them. Their archaic and unintelligible cost accounting system has led them into a blind alley. Their lack of planning to secure new aggregate business has left them with stagnating sales and promotion programs, all of which have made the railroads less than attractive to young men seeking challenging and rewarding careers.

Some of us have large investments in permanent rail-type plants, some of us have finally managed to make a chink in the wall of indifference so long thrown up against our efforts to encourage the railroads to . . . help themselves. Since our interests are parallel, we will continue to urge the railroads to join hands with us in a common effort to secure profitable tonnage.

However, considering the slipshod manner in which the railroads handle our business and how much must be done before the rails can hope to regain any appreciable tonnage, one wonders how they have retained any of our business. The answer must be (1) that so far the trucking of aggregates has not become an organized business, handled by efficient, centralized management; and (2) that there are some types of gravel and sand shipments which trucks could never handle competitively. In our part of the world most truckers are independent, owning comparatively few units. They have inadequate facilities for servicing and maintaining their units, and are not organized to secure business.

I have thought if we could overhear a stationary producer's prayer, it might run something like this:

"O, Lord, please touch the eyes of our natural friends, the railroad men . . . strengthen their hands that they might clean the coal dust and trash out of those cars into which we must load our filter bed sand. Provide them, please, with hammers and nails and good sound planks, to plug up the gaping holes in the bottoms of those cars which must carry our gravel.

"And, O, Lord, please keep awake the weighmaster, that he might read correctly the tare, gross, and net so that our customers might receive all the material for which they are paying. Help them not to lose our cars at interchanges; please keep them from being shunted to forgotten sidings, to gather mildew and dust.

"And if it is not asking too much, please send us a freight traffic representative who has even a small degree of rate-making authority, who understands the gravel and sand business just a little bit. Amen."

M & K Sand and Gravel Co. Acquires Texas Concern

Purchase of the Southwest Sand and Gravel Company, Ambrose, Tex., by the M & K Sand and Gravel Company was announced recently.

Included in the acquisition are a barge and related equipment and the lease of 132 acres of land. The plant has a capacity of 800 to 1,000 cu. yd. of washed sand and gravel per day.

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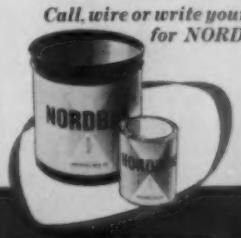

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N.S.A. Operators Meeting
Mirrors Procedure, Problems

THE yearly meetings of the plant operator members of the National Slag Association have traditionally been informal "shirt sleeve" sessions, on the premise that an atmosphere of that type would be most conducive to free exchange of ideas and opinion. The recent eighth annual meeting of these operators reflected the merit of this approach, both in terms of the wide range of subjects discussed and in a record attendance.

Held at the Sheraton-Cleveland Hotel, Cleveland, Ohio, on April 27 and 28, this meeting was the latest in a series that has recorded a larger participation in each successive year since its inception—without regard to locale. The agenda sparking this interest is based on subjects and queries submitted by the members concerning points of particular significance or difficulty in their operations.

By BUREN C. HEROD

W. E. McDermut, Illinois Slag and Ballast Company, who was general chairman of the operating group for the past year, presided at this meeting's sessions. The program chairman was Chester Mitz, Duquesne Slag Products Company, and the following men were members of his committee: John Hyson, Maryland Slag Company; Monty Truss, Vulcan Materials Company; Bill Moore, Cleveland Slag Division, Standard Slag Company; Bill England, National Slag, Ltd.; Jack Zelek, The Warner Company; Eli Miller, Standard Slag Company; and Tom McPoyle, Bethlehem Steel Company.

Topics indicated by the members prior to the meeting as those on which they desired exchange of experience were varied, and ran the gamut from source, types, and characteristics of raw materials to finished product handling. Most of the discussion centered on the more frequently troublesome operating problems, including iron removal from plant feed, equipment maintenance, dust control, supervision and control of remote processing stages, crushing, and lubrication. In addition, the merits—or shortcomings—of various types of machinery for particular applications were brought up, and the potential of several items of equipment not yet widely used was discussed.

One subject of interest to the operators—labor relations—was discussed by a man of long experience in the field. Frank R. Cadman, vice-president of industrial relations, The Warner Company, was invited to address the group at a luncheon meeting. Referring to his subject matter as the *Ju-Jitsu of Grievances,* Mr. Cadman pointed out that the Japanese definition of ju-jitsu is "To yield is to conquer."

Unfortunately, management does not always yield at advantageous

The 8th annual meeting of the National Slag Association's plant operators committee had a record attendance.

Informal sessions spark idea exchange on full range of operating details

Members of the program committee contributed significantly to the success of the meeting. From left, they are: John J. Hyson, Maryland Slag Co.; Bill Moore, Cleveland Slag Div., Standard Slag Co.; Monty Truss, Vulcan Materials Co., Birmingham Slag Division; Chet Mitz, Duquesne Slag Products Co., program chairman; Wilson McDermut, Illinois Slag and Ballast Co., general chairman; Bill England, National Slag, Ltd.; Jack Zelek, the Warner Company; Eli Miller, Standard Slag Co.; and Tom McPoyle, Bethlehem Steel Co.

times, he said; but in a bellicose mood engendered by labor demands that are regarded as unreasonable, management is more prone to "bull ahead." Face facts and accept them as they are, Mr. Cadman cautioned, because the unions attempt to turn your anger to your disadvantage. If you are going to wrestle with unions, he said, keep all levels of management, from the foreman to the top, acquainted with *all* labor regulations.

Make sure, he emphasized, that the wording of labor contracts covers all desired contingencies. Don't fall into the trap of expecting that the absence of reference to a given point will automatically eliminate its consideration in grievance procedures.

Consistent and reasonable discipline of the labor force is mandatory, Mr. Cadman declared, and it must be applicable throughout the operation to *all* men. Such an overall discipline program will support management's position if a grievance procedure is initiated. Along the same line, the policy of obtaining a signed copy of a notice to an employee of his infraction will lend support to management in protecting discipline procedures.

The general meeting discussion opened with consideration of stockpile measurement methods, in terms of accuracy and cost. Some members who had had experience or knowledge of aerial photography methods pointed out that aerial photos plus base measurement and cross-section surveys were effective; and that due to the properties of stereo photography there was no difficulty in computing pile volumes of materials of different sizes having different angles of repose. Also, the method was described as better than 90 percent accurate, even taking into account scattered and irregular piles.

On the subject of dense-graded base materials, one of the opera-

Below: Representing the operations which were leaders in the safety contest and received PIT AND QUARRY trophies were John Kellum, left, for the Middletown Plant, American Materials Corp., Class B winner; and Bill Pierce, right, for the Lackawanna Plant No. 2, Buffalo Slag Co., Inc., Class A winner.

Left: The new general chairman of the operating committee is Chester Mitz, right, Duquesne Slag Products Co. At the left is his program chairman, Bill Moore, Cleveland Slag Div., Standard Slag Co.

AUTOMATED READY-MIX PLANT BATCHES 2,000 cu. yd. DAILY, PRODUCES 1,500 MIXES

Five Barber-Greene conveyors coordinate movement of materials in show-place plant of Cleveland Builders Supply Co.

The Cleveland Builders Supply Co. ready-mix plant can produce 1,500 different mixes under electronic batching control.

When operations began in 1955, the plant was considered the largest commercial installation of its kind in the country. Because of site limitations, it is equipped with every modern device for control of each operation.

General Manager J. C. Ehle gives this report why five Barber-Greene belt conveyors totalling over 750' were selected for this show-place plant: "We rely on electronics to eliminate human errors in batching and we rely on Barber-Greene conveyors to coordinate movement of materials in the plant without production stoppages. Our experience with Barber-Greene conveyors goes back to the '20s. We've never touched an idler on any conveyor in this plant and our maintenance since 1955 amounts to one pulley replacement."

Discover why Barber-Greene conveyors move more material than all other conveyors combined in the aggregate and concrete industries. Your Barber-Greene conveyor specialist will gladly explain how standardized components, specially engineered components, or a combination of both can bring increased efficiency and lower materials handling costs to your installation.

Your belt conveyor equipment headquarters

Representatives in Principal Cities of the World

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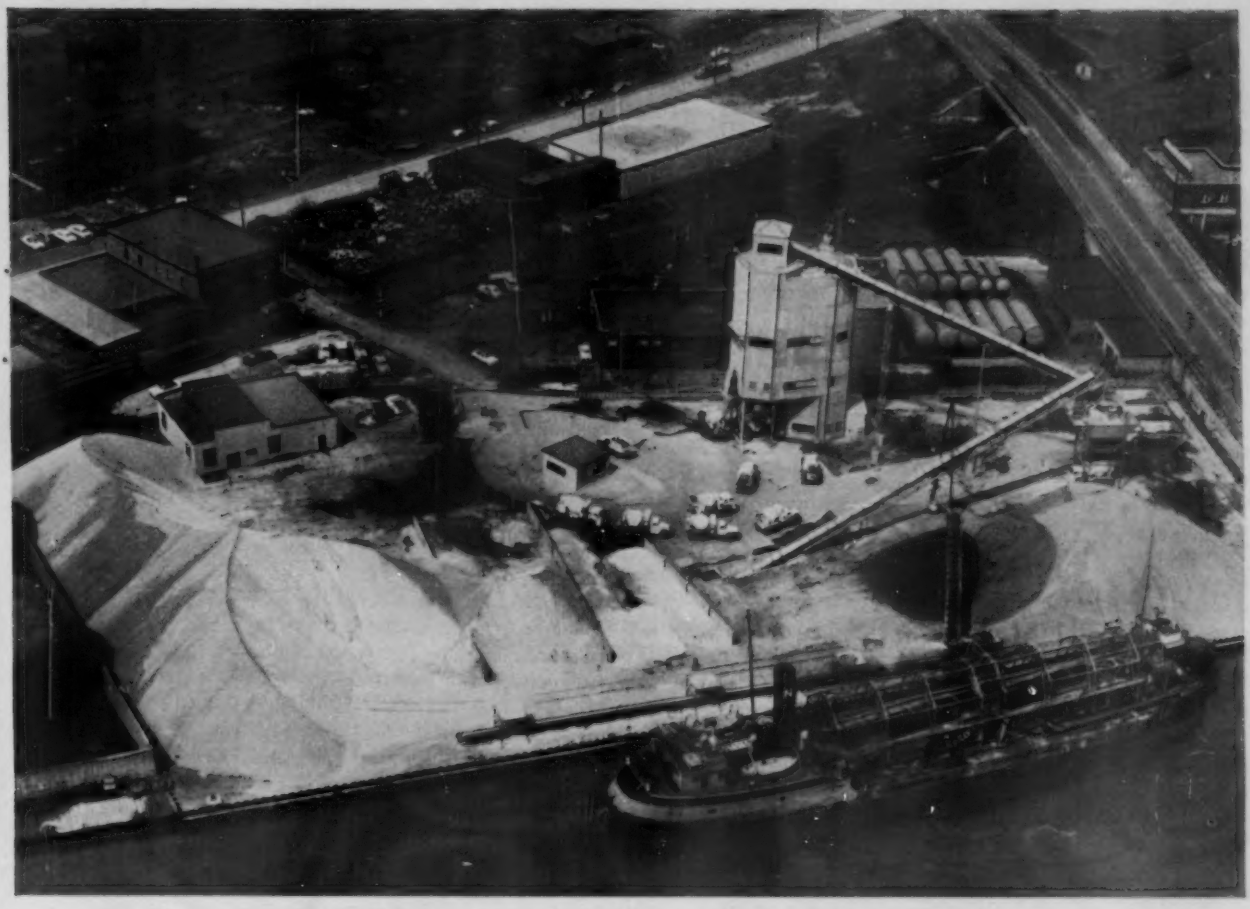
CONVEYORS • LOADERS • DITCHERS • ASPHALT PAVING EQUIPMENT

Locomotive crane is shown reclaiming aggregates from stockpiles and charging four bins. Two Barber-Greene conveyors beneath bins move materials toward batching tower.



Overall view shows C.B.S. plant layout on minute 3.2 acre site. Self-unloading boat is shown stockpiling 11,000 ton load of aggregate.

Operator merely selects card for the mix needed, and then electronic batch control system takes over, producing the desired mix automatically. Daily production: 2,000 cu.yd.

Some of 145-truck fleet are shown moving ready-mix to customers. C.B.S. is a 100% Barber-Greene conveyor user in other plants in Cleveland area.

tors described the use of fly ash to raise the 200-mesh factor to specification. In his procedure, the basic material (1 in. by 0) was removed from stockpile, and the fly ash was mixed in as the material was prepared for shipment. The respective merits—and costs—of various pug mills were noted. With respect to possible difficulty from stockpiled material (in the smaller size ranges) setting up if piled too long, one operator indicated that the use of a 'dozer with rippers is effective.

Iron removal from material in process is an effort common to all operators. It was indicated that drum magnets installed in chutes have done a good job. Apparently they are most effective when placed in the finished product end of the flow, where the quantity of each individual fraction passing through a chute is less than that of the combined materials earlier in the flow. Work-hardened shells have shown the most durability.

With respect to iron recovery for furnace use, various operators have used both hand-picking at the plant feed end, and magnets farther along. Hand-picked material averaged 55 percent iron in one operation, while that recovered by magnets was a bit lower. Several *pros* and *cons* concerning permanent magnet and electro-magnet head pulleys were brought out. Water used in dust control, plus the steam from slag, has been rough on the electro-magnets, according to several men.

Apparently a manufacturing process contributes to the problem which results from condensation in the pulley shell. If the latter has been packed with insulation for the magnets under atmospheric conditions, condensation has resulted. However, when rebuilt and packed under vacuum, there has been no more trouble. It was noted that the use of epoxy resin packing is increasing and is a favorable development.

Another method of combating condensation involves partial energizing of the electro-magnet while the pulley is inoperative. This was done under rheostat control to preclude burning up the unit.

Discussions of expanding procedures indicated that, in the pit method, an important point is to keep the pit floor clean and avoid formation of potholes in which water will collect. In the spray method, the secret to efficient operation apparently involves slow ladle pouring and water spray control. If ladles have stood for prolonged periods (up to an hour), the surface crust should be broken to permit gases to escape—a precaution against explosions.

Mortality and excessive wear of both clamshell buckets and their cables in pit operations was cited as a prime problem. The majority of the operators seemed to regard a particular make of clamshell bucket as superior to other products. For one producer, the use of a reinforced perforated dragline bucket with related drag chain has eliminated high cable mortality caused by contact with the pit material. The bucket has also had a good service life.

The problem of screen blinding had been encountered by many of the operators present. Heated screen decks were said to be quite effective, but in the most severe weather, even heated decks were not efficient unless the screens were housed. A combination of heated deck and ball tray was described as doing an excellent job. Interestingly, one operator pointed out that in his experience too much heat applied to heated deck screens would also cause blinding.

On a maintenance point, it was noted that plain bearings are simpler to replace in basemount speed reducers than anti-friction bearings. While the former require more frequent lubrication, it was suggested that it may be better to live with more frequent lubrication schedules than to face a major job in bearing replacements.

Conveying equipment and components came in for considerable review. Experience in several plants with steep-angle idlers seems to be universally favorable. Among the advantages pointed out by various operators were increased belt life and the ability to handle the same tonnage on a given conveyor with less belt width. The most popular units seemed to be the 35-degree idlers.

Lagged snubber pulleys and wing types were considered to be quite effective in self cleaning. Depending on the presence of moisture, lagging life ranged from three to about eight months, and occasionally longer. Power-driven belt brushes were regarded as effective belt cleaners, but some dissatisfaction was expressed with brush life. Apparently, these must also be tailored to the specific job in terms of correct speed, type of brush, and other factors.

A new equipment item that sparked extensive comment was waterproof lighting systems for tunnels and other high-moisture areas. The problem of condensation in conduit lines has been eliminated, according to those who have installed the system. Other operators have fought the problem by drilling holes in the bottom of conduit for drainage and air circulation. The primary cause of condensation formation appears to be the fact that the conduit runs through areas of varying temperatures.

Condensation on vibrating feeder mechanisms has also been a matter for correction. Complete coverings, absorbents, and unit heaters are among the methods used to combat the problem.

Among the many other items brought up for exchange of ideas during the meeting were crushing equipment, maintenance schedules, types of lubricants, radio communication, and dust control.

Following the luncheon on the second day of the meeting, winners of the association's 1960 safety contest were recognized and presented with awards. In addition to the presentation of a member of Certificates of Achievement, the winners in classes A and B of the contest were also presented with PIT AND QUARRY trophies. The Class A winner was the Lackawanna Plant No. 2, Buffalo Slag Co., Inc., and the trophy was received by Bill Pierce for the superintendent of that operation. The Class B trophy was received by John Kellum, representing the Middletown Plant, American Materials Corp.

In accordance with precedent, the past year's program chairman, Mr. Mitz, was elected to succeed Mr. McDermut as general chairman of the operating committee. The new program chairman is W. Moore.

The next annual meeting of the plant operators will be held in Washington, D. C., in late March or early April, the date to be announced later by E. W. Bauman, managing director of N.S.A.

Experts Call for New Approach To Depreciation Tax Allowances

NOW MORE then ever American business is speaking out against the inequities and handicaps of present depreciation tax laws. To review the tax depreciation problem in depth, the April issue of *Credit and Financial Management* magazine (official publication of the 35,000-member National Association of Credit Management) is publishing appraisals made by a leading economics professor, a certified public account, a controller, and an attorney. More than one-fourth of this magazine was allocated to this four-way look at the pitfalls, problems, and recommended changes in present tax depreciation allowances.

Dr. Clyde William Phelps, a professor of economics at the University of California, sees the present laws as a direct inhibitor of economic growth.

"The present generation," writes Dr. Phelps, "is having to learn anew the historical principle that the recurrence of recessions is basically due to the repeated attempts to 'stimulate' business by means of unsound credit expansion and excessive government spending. Recurrent recessions are nothing more nor less than the price that must be paid for inflationary booms—like the morning-after price that must be paid for the preceding night's binge.

"A sound way to stimulate business is to permit it to have enough funds left after taxes to replace and increase the plant and equipment needed for economic growth. Here, permitting businesses fully adequate tax depreciation allowances would be directly and immediately stimulative, considering the fact that the deficiency of presently allowed depreciation is running in excess of $5 billion per annum because of the effects of creeping inflation.

"The economic growth curve of the United States over the years has not run parallel with the slow rate of increase in the population and the labor force. Rather, it has paralleled the rise of invested productive capital in the form of plant, equipment, and . . . horsepower.

"What is the really basic requisite for economic growth, assuming a free enterprise system to which political leaders and their intellectual advisers give lip service? Such growth is best measured by increase in production per man-hour. But does it come from mere labor?

"Even if a worker should put forth physical and mental exertion, to the accompaniment of greatly increased sweat and strain, his unaided production per hour could grow but little. However, if he is permitted to sit down at a new, improved machine — operating at greater speed and precision, aided by increased horsepower, with more effectively engineered material-handling equipment, in a better designed plant—his output per hour can really grow.

"But new machines, motors with greater horsepower, and improved plant and equipment can be provided only by investment. Someone has to put up the money to replace plants and equipment that wear out or become obsolescent, as well as to build new facilities. When, because of inflation (which government policies will continue to inflict upon us), it costs more to replace plant and equipment than the inadequate depreciation allowed under present tax laws, economic growth is necessarily slowed down."

Dr. Phelps further points out that the more liberal depreciation allowance in leading foreign countries "has been an important reason in explaining their superior rates of economic growth in recent years as compared to ours."

"To take one study, based on equipment with a 15-year life for depreciation purposes," he continues, "the percentage permitted to be written off over the first service year would be 13 percent of cost in the United States, as compared with more than 50 percent in Japan and the United Kingdom, over 30 percent in Sweden and Italy, and more than 20 percent in Canada and France. Over the first three years of service the percentages written off would be as follows: 35 percent, United States; more than 70 percent, United Kingdom and Sweden; over 60 percent, Japan and Italy; 54 percent, Canada; 47 percent, France."

Maurice E. Peloubet, C.P.A., Pogson, Peloubet and Company, New York, adds, "There are two principal results of inadequate depreciation: income is overstated, and taxes are overpaid. These affect the financial position of the taxpayer in several ways. The overstatement of income leads to increased demands for dividends and increased demands from labor, because the stockholders and employees think there is that much more to be split up.

"The increased taxes, if based on overstated income, are paid not out of earnings but out of capital. Until it is necessary to replace, rehabilitate, or modernize machinery, the inadequacy of the depreciation and the depletion of capital are not recognized.

"When this happens, the unfortunate taxpayer finds that his provision for renewals or replacement is woefully inadequate. He must find the funds to bring the provision up to what is needed."

In conclusion, Mr. Peloubet says, "With one-third of our productive facilities obsolete and with our current depreciation allowances about $6 billion per year less than they should be, it is high time to do something, not only to save the manufacturer and the user of long-lived machinery, but to insure the continued productivity and competitive ability of the entire economy as well."

N.A.C. Sales, Profits Dip— Reflecting Depletion Changes

North American Cement Corporation (now known as NAC Corporation since January 31 as a result of its purchase by Marquette Cement Company) has reported for 1960 the following business results: net sales at $17,542,446 *vs.* $18,771,594 in 1959; net income at $1,503,392 *vs.* $2,216,381; earnings equivalent to $2.09 per common share *vs.* $3.08.

Results for both years reflect recent percentage depletion computation changes.

"Euclid scrapers have tripled our yardage ...cut cycle time 60%"

"In 3 years only two day's downtime for each of our 3 'Euc' Rear-Dumps"

W. A. Schemmer Limestone Quarry, Inc. at Logan, Iowa produces 1500 tons of crushed stone per day... close to a half million tons annually... for highway construction, river stabilization work and agriculture. Up to 70 feet of overburden has to be removed from the 30 feet of limestone.

Replacing crawler-drawn scrapers, two Euclid TS-24 Scrapers are now used for stripping. They have greatly reduced costs on this phase of the operation. Cycle time from the stripping area to spoil bank and return has been reduced by 60% and yardage moved per hour has more than tripled. First major repair work was done after 4000 hours of operation on the first "Twin" that went into service in January of 1957. There has been no downtime on the other "Euc" that has been working 17 hours a day since April, 1960.

On a half-mile round trip from the loading shovel to the crusher, three R-10 Rear-Dump "Eucs" haul a total of 1500 tons per 10-hour day. Working an average of 250 days a year, these 10-ton haulers have posted a fine availability and low maintenance cost record. In three years of operation the 3 "Eucs" have required no major overhaul and there has been only two days of downtime for each machine during that long period.

Prior to going into the quarry business in 1948, Mr. Schemmer had his own highway construction firm so he speaks from long experience with heavy equipment when he says, "The extremely low operating cost of our Euclid scrapers and trucks has been a major factor in the success of our quarry operations".

GM GENERAL MOTORS EUCLID

EUCLID

FOR MOVING EARTH, ROCK, COAL AND ORE

"Two Euclid TS-24 Scrapers and three R-10 Rear-Dumps enable us to turn a profit stripping 70 feet of overburden for 30 feet of limestone".

W. A. Schemmer, Pres., W. A. Schemmer Limestone Quarry, Inc.

EUCLID Division of General Motors
Hudson, Ohio

Plants at Cleveland and Hudson, Ohio and Lanarkshire, Scotland

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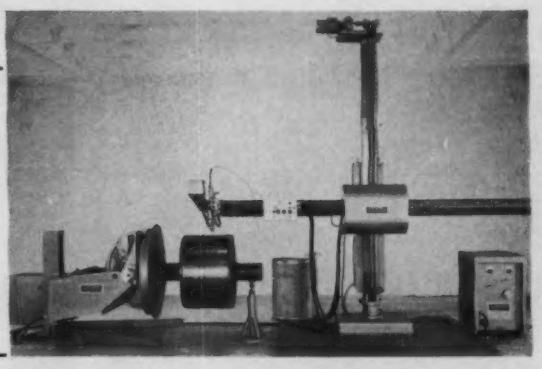
Announcing **3 NEW STOODY Automatic Welding Systems!**

Stoody has long been the recognized leader in alloy wires for automatic hard-facing as well as for hard-facing rods and electrodes. No other manufacturer offers equal experience or a product line so versatile and complete.

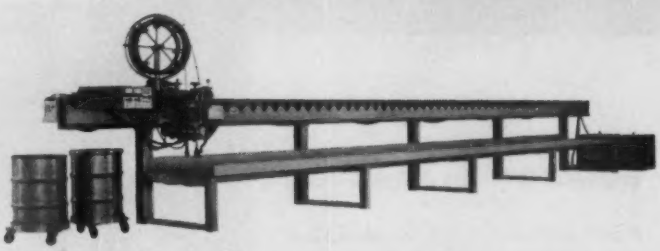
Now Stoody augments the best hard-facing materials available to industry *with a whole new line of automatic welding machines* covering specialized and general needs. Before investing in any automatic welding machines check with Stoody... pioneers and developers in the field of hard-facing, *manufacturers of the latest designs in AUTOMATIC WELDING SYSTEMS!*

1 **STOODY CRUSHERMATIC**—A compact, versatile system for automatically rebuilding and hard-facing crusher rolls in position. It enables the welder to work outside the crusher chassis in comfort and clean air. The Crushermatic consists of a motorized carriage riding a track which is suspended over the crusher roll. Wire is supplied to the carriage by any standard semi-automatic wire feeding unit. Uses a 400 amp power supply but 600 amps are preferable. Versatile electronic controls provide proper sequencing for a *variety of circumferential and transverse welding patterns.* The Crushermatic is portable by one man and is slipped into permanently welded brackets when in use. *It deposits up to 20 lbs. per hour—300% to 400% faster than manual welding and 200% faster than hand-held semi-automatic welding.*



2 **STOODY MODEL U W UNIVERSAL AUTOMATIC WELDER**—The Model U W provides a complete welding system capable of cylindrical, conical and straight line welding. The 3000 lb. capacity positioner *tilts the workpiece through a 120° angle and is equipped with power elevation and thyratron controlled rotation.* All electrical controls are unitized in a *portable control panel* for maximum operator convenience. *Ram type manipulator* has a vertical travel from 6" to 8'-6"; Horizontal travel: 10'; Travel speed range: 5 imp to approximately 60 ipm. Manipulator mast *rotates through 360°.* Power source: *DC, constant potential selenium rectifier type.* Input: 220-440 V, Output: 500 amps at 40 V 100% duty cycle. 5 point slope control.

3 **STOODY MODEL T L DUAL-HEAD TRACK LINK WELDER**—Provides dual welding heads with wires supplied from twin Payoffpaks for fast, efficient rebuilding and hard-facing. Extremely rugged construction. Features: *Special gear-type wire feed rolls; positive high frequency starters; wider, lower bed for easier accessibility and greater capacity; heavy-duty double worm reduction gear box with DC variable speed travel drive motor. Unitized control panel.* Bed length 40'; Bed width 46"; Bed height only 24"; Power: 2-500 amp constant voltage 100% duty cycle 220-440 V power sources.



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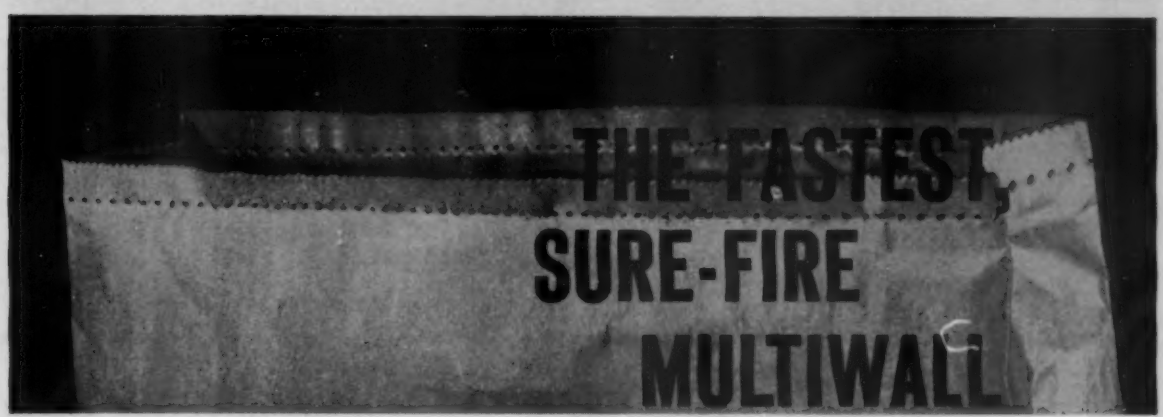

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Ready-mix producers . . . and all users of *sewn* multiwall bags: Here is the fastest, cleanest multiwall bag opening — Bemi-Strip.

Bemi-Strip gives a tight seal. Yet, to open, your customer need only grab the red tab and pull. The bag opens quickly, cleanly. No fumbling for thread ends. No cutting. No stuck closure seams. Your customers will appreciate the convenience.

Note: Production machinery to manufacture the Bemi-Strip feature is being installed in Bemis plants as rapidly as possible, but the feature is not yet available on the West Coast or in parts of eastern United States. The feature will be available nationally in just a few months. Ask your Bemis man for complete information.

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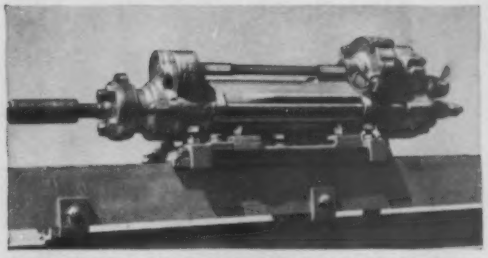
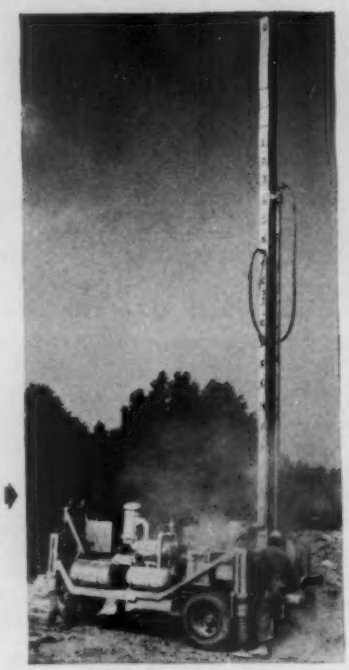
GARDNER-DENVER quarry equipment



NEW PR123 POWER-ROTATION ROCK DRILL Provides absolute control—new Gardner-Denver PR123 has independent rotation control . . . variable forward speed, variable reverse speed, plus neutral position. Now driller can select right combination of rotation, drill impact, feed pressure and hole blowing for fastest penetration in any type of rock.

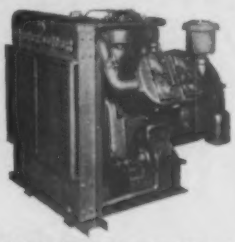
NEW ZEPHYR ROTARY BLAST-HOLE RIG. For fastest drag bit operations—the new Zephyr is a self-propelled, self-contained rig designed for one-man operation. It features 10,000 lbs. pull-down pressure on bit, instantaneous travel control, heavy-duty rotary table with four speed options; and a 200 cfm air package. Track and wheel models. Hole sizes from 1¾″ to 4½″.



SWING-BOOM "AIR TRAC"® Most versatile crawler drill available—boom swings in arc of 11′10″ . . . reaches 2½′ over both sides of tracks. For horizontal holes, mast reaches 9′6″ above floor. Swing-boom "Air Trac" is self-equalizing, self-stabilizing . . . moves quickly and easily over rough, rocky terrain. Drill rod change to 20′.

"MOLE-DRIL"* Percussion drill for rotary rigs—"Mole-Dril" cuts big bore hole in hardest formations quickly. Drill follows bit down through rock, screws on end of drill pipe.

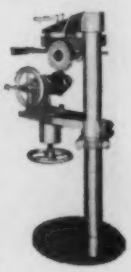
* T. M.



W-TYPE COMPRESSORS. A water-cooled work horse—here's a stationary compressor that installs easily, runs smoothly and requires little maintenance. Models in capacities from 143 to 1395 cfm.

BROACHING DRILLS. Three heavy-duty models—have interchangeable chucks for drilling and broaching. Drill wet or dry. Feeds available from 7′2″ to 13′4″. Mounting slide provided with gibs and removable shims.

BREAKERS Rugged, hit hard—a size and weight for every requirement.



BIT GRINDERS Fast, efficient—sharpen full range of cross and X-type bits.

AIR FEED LEG DRILLS Lightweight, easy to use—two bore sizes, 2½″ and 2⅝″.

DRIFTERS Automatic and continuous-feed models—bore sizes from 2¾″ to 4″. Deep hole drills available in bore sizes of 4″, 4½″ and 5½″.

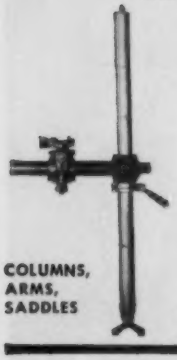
SINKER DRILLS Speed secondary breakage—five models, 2⅜″ to 2¾″ bore.

to help you produce more at less cost

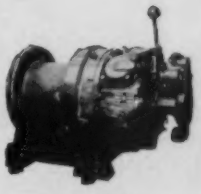
NEW ROTA-SCREW PORTABLE AIR COMPRESSORS. Reduce maintenance to a trifle—new-type rotary screw compressor has no touching parts in compressor chamber . . . no blades to inspect or replace. It delivers pulsation-free, compressed air flow almost instantly on start-up. Rota-Screw portables operate off level . . . operate in all weather, 40° below to 115° above zero. Three sizes: SP900, 900 cfm; SP600, 600 cfm; SP125, 125 cfm.

NEW HI-LEED DRILL STEEL. Never before drill steel like this—HI-LEED steel is designed to always uncouple by hand. It combines field-proven reverse buttress design with entirely new thread form that eliminates the wrench.

HT143 CRAWLER ROCK DRILL. Takes a rod change to 30′—Gardner-Denver HT143 carries a hard-hitting, 5½″-deep hole drill on a heavy-duty drilling mast. It is self-propelled. All controls centralized for ease of operation.



COLUMNS, ARMS, SADDLES



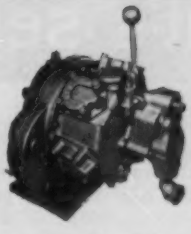
AIR HOISTS

SUMP PUMPS

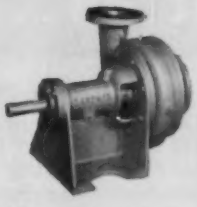
DRILL STEEL FORGES

MINE CAR LOADERS

IMPACT WRENCHES



AIR MOTORS



CENTRIFUGAL PUMPS

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DRILL FEEDS, BOOMS, POSITIONERS

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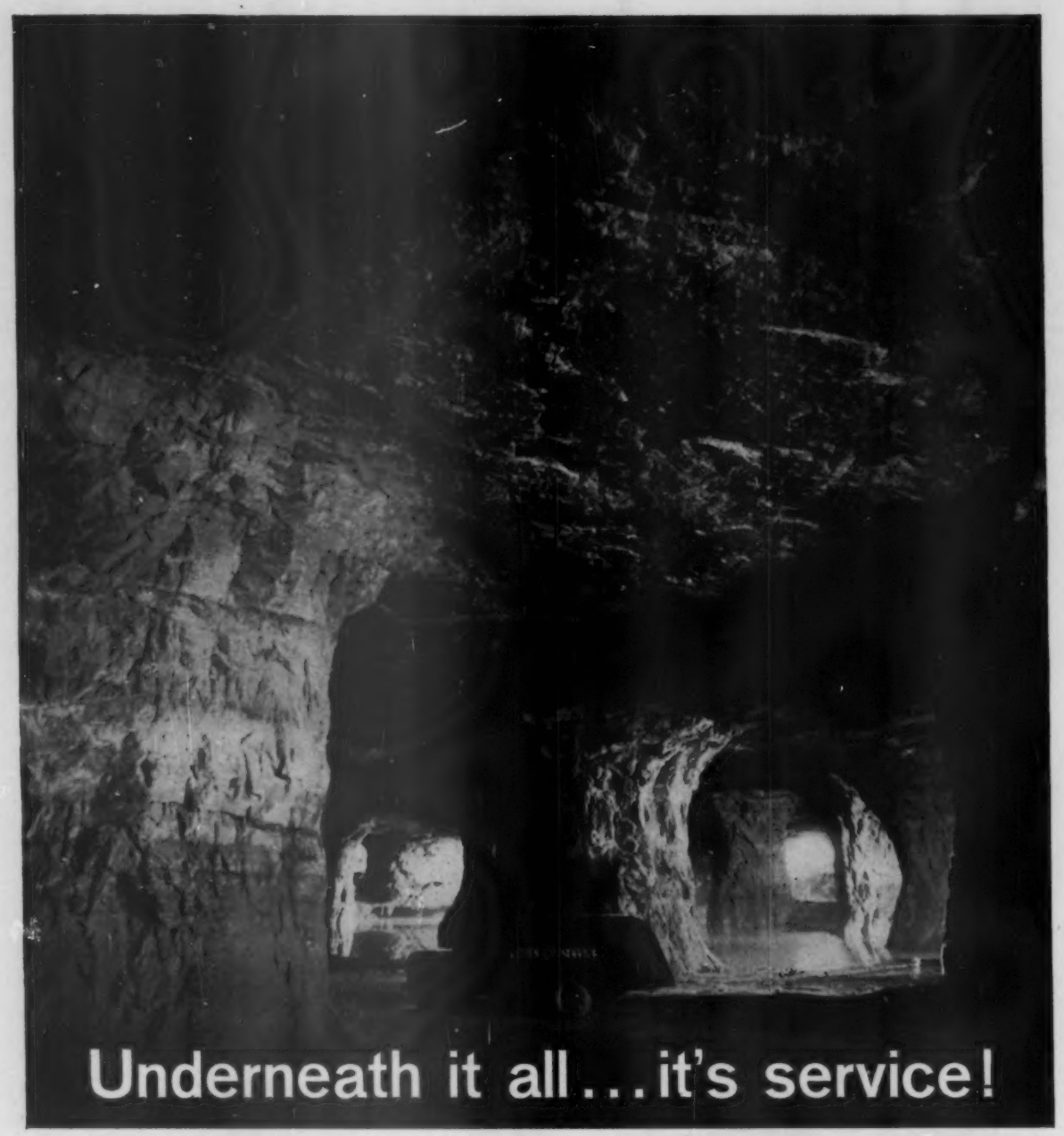

Underneath it all... it's service!

THERE'S only one way to get to the Weiler Marble Company quarry of Ste. Genevieve, Missouri. Down a rough dirt road . . . over a steep hill . . . and deep into the ground. This is no problem to Cities Service. It's just another example of how every customer gets reliable service . . . no matter where he is!

The Weiler Company has depended upon Cities Service for the past 2½ years. Mr. Herman Weiler, President, is impressed with the products as well as the service. For drilling, his company counts on Neptune 13Z oil. He states, "It's the best drill oil I've ever used. Really sticks to the metal it's applied to."

Mr. Weiler's Schramm 600 air compressor engine has been running 12,000 hours on DC-300 oil without a repair. Results such as this convinced him to use nothing but Cities Service products for all his equipment.

Mr. Weiler gets expert technical help, fast dependable service, and the best products available . . . all from Cities Service. You will, too! For more information, contact your nearest Cities Service Office or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, New York.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

Legal Decisions

On Industry Problems

By LEO T. PARKER
Attorney at Law
Cincinnati, Ohio

Law Suits Involving Injuries to Employees

IT IS true, of course, that all manufacturers, processors buyers and sellers of nonmetallic materials employ lawyers. Nevertheless, even a thoroughly good lawyer has practically no chance to win a suit for a client who has already lost the suit because of insufficient legal knowledge. It is certain that readers who regularly read the cause and outcome of outstanding law suits involving other readers will be prepared to avoid a majority of expensive legal controversies.

A few days ago the writer returned from travels through southwestern and southern states where I had the pleasure of talking personally with numerous readers of PIT AND QUARRY about legal problems. In view of the fact that many of these persons asked legal questions pertaining to damage and compensation payments to injured employees, I shall in this article review late and outstanding higher court decisions dealing with these subjects of law.

It is true, of course, that a majority of courts believe that every employee injured while working within the scope of his employment should recover compensation. However, compensation is payable strictly according to provisions of state laws.

For illustration, in *Alma* v. *Department of Labor,* 373 Pac. (2d) 249, the Hon. Judge Donworth said:

"I think that, in determining whether or not there has been an injury compensable under the workmen's compensation act, we are limited by the statutory definition of the work injury."

Many other higher courts have expressed their views to the effect that while an injured employee should be entitled to recover compensation, yet valid state laws prevent many allowances.

Confusing Testimony

Where an award of compensation, under the State Workmen's Compensation Act, is practical, the courts favor the award.

In fact, very frequently a higher court will award compensation to an injured employee although the testimony is vague, confusing, and conflicting. A few weeks ago a higher court rendered a decision which clearly verifies this statement of law.

For illustration, in *Forshey* v. *Industrial Commission,* 337 S. W. (2d) 544, the testimony showed facts, as follows: A man, named Forshey, was employed in special and unusual work by U.A.C. Company. Forshey worked in a room in a kiln building. In this structure are several large kilns in which the limestone and shale, which are constituent elements of cement, are heated. Each kiln is equipped with a stack extending above the roof through which the kiln gases escape. It is necessary periodically to clean out these stacks by a process known as "shooting the stacks." In each stack there is a door about four and one-half feet from the floor, and in the center of the stack a short rectangular post.

A channel iron is inserted through the door and in such manner that its further end is rested on this post. The channel iron is about 12 feet in length and weighs about 200 pounds. At the far end of the channel iron, which rests on the central post, a charge of explosive powder is placed. This powder is detonated by electricity. The resulting explo-

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When you store bulk materials . . . you want a storage system that is safe, economical and fits your materials handling concept. Here's where Marietta comes in. Every Marietta Industrial Storage System is engineered to meet precise requirements. And yet, Marietta industrial silos have a built-in flexibility that allows for future use as well as present need. That's because Marietta applies more than 40 years of experience to every phase of planning, design, fabrication and construction.

Standard Industries' new Tulsa production system is built around these Marietta silos.

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Enter 139 on card, page 177

sion cleans the stack. The channel iron is carried from one stack to another by three men (including Forshey at the time of the accident).

One day while the channel iron was being carried, Forshey stooped low to pass under a large pipe known as a heat conveyor. Forshey testified that in going under this pipe the channel iron slid down, and struck him in the lumbar region. He said that at the time he experienced severe pain in the lower part of his back, and he exclaimed, "Boy, that got me." The channel iron dropped to the floor. Although suffering considerable pain Forshey continued his work for a few days.

During the following seven months he was in and out of various hospitals, and finally the surgeon at the Veterans Hospital performed a laminectomy on Forshey in which a degenerated intervertebral disc between L-4 and L-5 was removed and those vertebrae fused. As a result of this operation Forshey was advised by his doctor that he should refrain from heavy lifting, straining, or anything of that sort.

When Forshey applied for compensation under the State Workmen's Compensation Act, it was contended that his present disability was the direct result of the back condition or injury he had sustained previously. The testimony showed that Forshey never fully recovered from the aforesaid back injury.

However, he entered the United States Army and there resumed active duty as a machinist. Some of his work involved lifting heavy objects.

Moreover, there was no mention of any physical disability or infirmity noted on his discharge papers.

Notwithstanding these various procedures, the higher court awarded Forshey substantial compensation, saying:

"In a workman's compensation case the burden is on the claimant employee to establish by the greater weight of the credible evidence that the disability complained of is the proximate result, in whole or in part, of the alleged accident. The cause is remanded with directions to enter judgment affirming the award of the Industrial Commission."

Accidental Injury

Various courts have held that an injury which is developed from constant and continued labor, no matter how heavy or arduous it may be, is not covered by the State Workmen's Compensation Act, which authorizes payment of compensation for injuries sustained by accident. However, any injury resulting from an accident is compensible.

For example, in *Cavanaugh* v. *Industrial Commission,* Cleveland, Ohio, 194 N. E. 602, it was disclosed that an employee attempted to catch a heavy bag of cement which slipped from his hands. He sustained a severe injury to his back.

The higher court indicated that the employee was entitled to a compensation on the basis that his injury resulted from an accident and said:

"A strain of the muscles of the back, caused by lifting heavy weights in the course of business, is injury by accident. . . "

Exemplary Damages

Modern higher courts hold that any employer may be liable to an injured employee for exemplary damages in addition to normal or actual damages only if the testimony shows that the employee's injury resulted from the employer's gross negligence.

In one case, for example, an employer was held liable to an injured employee for $2,000.00 actual or normal damages, and $22,000.00 exemplary damages. In this case the testimony showed that an employer had refused to repair a defective concrete mixer, although he knew that it was extremely dangerous. The employee was injured due to the defective condition of the mixer. The court held that the employer was grossly negligent.

On the other hand, if the injured employee had any authority or right to reduce a hazard which caused his injury, he cannot recover exemplary damages.

See the late higher court case of *Wooley* v. *S.P.C. Company,* 272 Fed. (2d) 906. In this case the testimony showed that an employee named Wooley was a safety engineer at a cement plant. He received fatal burns when preheated cement dust was blown on him while he was personally directing a repair crew to clear the feed pipe which had become clogged up. The testimony showed that the cement dust came from a storage bin through a preheating device that raised the temperature of the dust to 600 to 800 degrees, after which it went into the kiln for heating to a range of 2,600—2,800 degrees. From time to time the feed pipe, leading from the mixing-storage manifold to the kiln, became plugged up. When the feed line became clogged up, the usual remedy was to open up an access door, and insert a metal pipe into the cement dust material in the feed pipe. The metal pipe was fastened to an air hose connected to an air pressure pump. During this unplugging operation there had been a number of instances in which pressures, apparently built up from the high temperatures in the preheating device or in the kiln, caused some of the material to "belch" out of the feed pipe, through the opened access door. To perform this repair operation the workers had to stand on a raised platform which was so located that if the material belched out under some pressure, it would spew onto the platform and the access stairway.

On the occasion of Wooley's fatal burns, the feed pipe became clogged up, as it had in the past. Wooley knew this because he personally directed the two men assigned to him as a repair crew to clear the pipe.

The deceased Wooley's widow sued the S. P. C. Company for many thousand dollars exemplary damages, in addition to actual damages.

It is interesting to observe that as Wooley acknowledged that he knew that gases of sufficient pressure to spew out cement dust were generated and that he had never required that the S.P.C. Company undertake or make tests to determine whether the access door (cap) would withstand these expected pressures and still remain closed, the higher court refused to award exemplary damages. This owner said:

"To assume that these acts were negligent is not sufficient to justify

(*Continued on page* 145)

Normal 3/16-in. bearing wear in 90-day period... reduced to .008-in. over 4-year span

with ALEMITE CENTRALIZED LUBRICATION

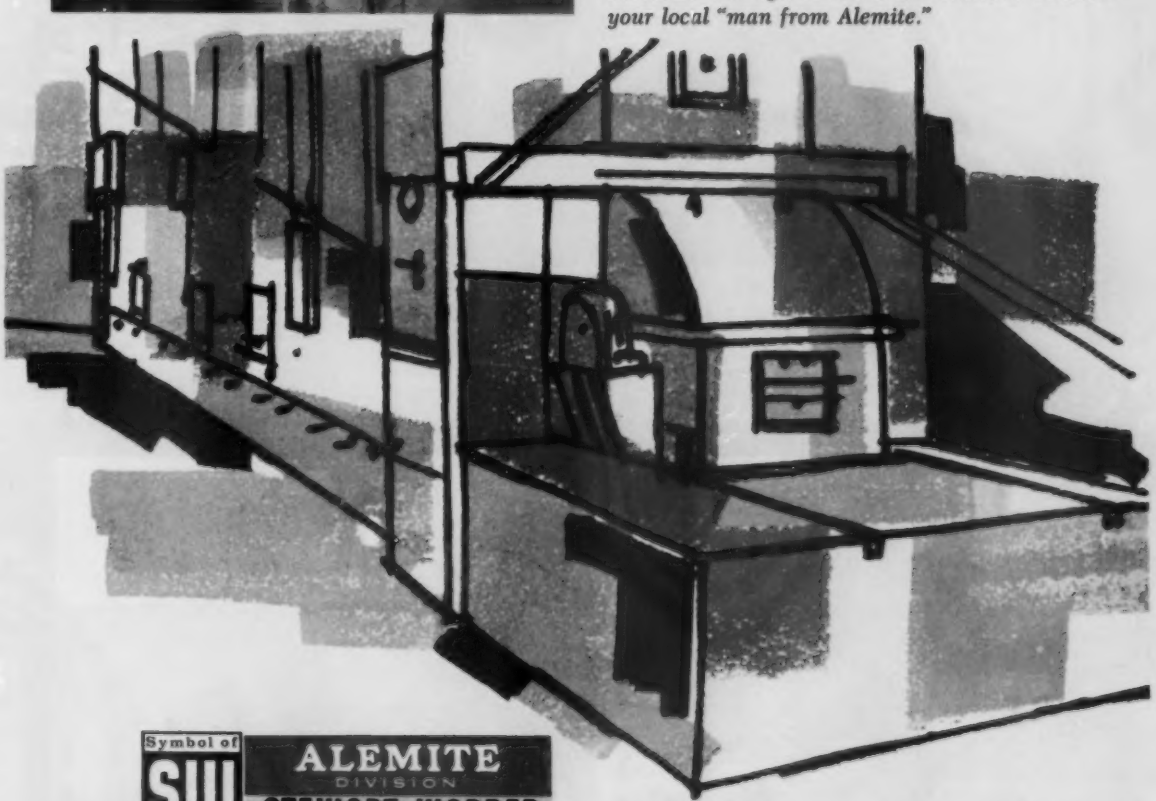
Bronze bearings on inclined grate coolers, when lubricated by hand, usually wore 3/16-inch in about 90 days. When a large cement company installed an Alemite Accumatic Centralized grease system on its coolers, bearing wear was reduced to only .008-inch in four full years of continuous production . . . thanks to the versatility and flexibility of *automatic* Accumatic lubrication.

Periodically, this Accumatic system pressure-pumps, from a central supply source, accurately measured amounts of uncontaminated lubricant direct to the bearings. Hands and air never touch the lubricant . . . nor does air-borne dirt and dust, because the Accumatic system makes it possible to *encase* the bearings in a pressurized housing, further extending life and reducing wear!

With an Accumatic system, there's no over-lubrication . . . no over-looked bearings . . . no waste. The value is obvious: *much longer bearing life . . . much less bearing replacement* . . . much more productive operating time from your machinery.

Let Alemite solve your lubrication problems; they'll design a Centralized Lubrication System to fit your specific needs. Write today . . . or contact your Alemite Representative.

See "The Better Way," a factual film presentation about one cement mill and its cost-reducing methods through modern lubrication. Contact your local "man from Alemite."



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EXPLOSIVES

At this Maryland quarry, Ammodyte,™ a low-cost cartridged explosive, was used to obtain maximum fragmentation and displacement of this tough, blocky granite gneiss. In the large photo above, notice how the toe is sweeping clear, resulting from well planned bottom initiation with Rockmaster™ millisecond delay electric blasting caps. The resulting muck pile is properly laid out for easy, efficient digging.

ENERGY...

Are you aware of the many ways it is cutting costs all along the line? . . . Boosting production? . . . Increasing life of heavy equipment? . . . Allowing more efficient use of total man-hours?

Cheaper blasting materials, new blasting techniques, and improved drilling equipment, have reduced the cost of explosives energy to the point where it is doing work formerly reserved for mechanical equipment. And doing it cheaper, faster, and more efficiently.

In the Maryland quarry shown here, achieving good breakage was a difficult problem. This granite gneiss is tough and blocky. And production demands couldn't wait for drop balling or a blocked crusher. Working with the Atlas Representative, these profit-minded operators modernized their blasting techniques.

By adjusting hole diameter, burden and spacing, and utilizing the wallop of low cost Ammodyte,® these operators are gaining breakage and displacement never achieved before. Production speeds have been increased because they have been able to dig shots quicker and easier and gain maximum crusher production. In the process, they are realizing real savings in maintenance and wear on crusher, dipper teeth, wire rope, and truck bodies.

In coal stripping, other alert, up-to-date operators are using explosives energy to accomplish new tasks. Explosives force is being used to move up to 50% of the overburden directly onto the spoil pile. Mechanical handling costs are reduced, coal is uncovered more rapidly.

In open pit ore mining, explosives factors are being designed to gain additional fragmentation. Much of the material by-passes the primary crusher. Production is speeded, overall costs lowered.

In construction, contractors are finding that explosives energy can save them unwelcome maintenance costs on valuable equipment, and accomplish work faster, more efficiently.

In these times of change, the economics of drilling and blasting have changed also. Looking for ways to reduce blasting costs alone is not enough. The real savings come when you look at explosives energy as a way to reduce overall operating costs.

For a closer look at some of the ways explosives energy can lower your costs, investigate Atlas' full line—the only full line of ammonium nitrate and explosives in the industry. Expanded plant facilities are now in production at Joplin, Mo. and Reynolds, Pa., to assure ready availability of all products. And to give you faster, more flexible local service, expanded distribution facilities are being established coast to coast.

Call in your Atlas Representative. His experience with the newest advances in explosives, blasting agents, and blasting techniques can help you measure the relative economy of explosives energy vs. mechanical energy for your particular operation. Ask him about it. Or write directly to:

ATLAS POWDER COMPANY
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ATLAS EXPLOSIVES

IF THESE CLAIMS SEEM UNBELIEVABLE—

Our customer says to phone him for the facts about his 2-year-old

THOMAS

Durable Dredge Pump

If you knew a man who was saving several hundred dollars a month in sand-and-gravel pump maintenance and repairs you would want to investigate the facts.

R. Patrick Spangler is doing just that. He operates Spangler & Sons, Inc., a prominent firm doing a ready-mix concrete and concrete construction business in Shelby, North Carolina. He operates a 6" THOMAS Durable Dredge Pump with which he has had no pump repair or maintenance expense in over two years, as compared with frequent repairs and adjustments necessary for the pump he was using previously. Mr. Patrick says that never in his experience has he bought a piece of equipment which so far exceeds the claims and commitments of its manufacturer. Read his letter at right.

"If anybody doubts what I say," states Mr. Spangler, in a phone conversation, "have them call me and I'll give them the facts straight from the shoulder."

No other sand and gravel pump equals the Thomas in performance because the Thomas Pump is uniquely and especially designed to be made of genuine dependable THOMAS NI-HARD—one of the hardest and most abrasion-resistant metals of the foundry industry. "You cannot buy at any price a more durable pump than a THOMAS for sand and gravel—you cannot buy one that will make you as much money." Additional information gladly furnished upon request.

SPANGLER & SONS, INC.

Transit Mix Concrete — *Concrete Construction*

P. O. Box 1270 — Shelby, N. C.

March 14, 1961

Thomas Foundries
P. O. Box 1111
Birmingham, Alabama

Dear Sir:

We would like to have our name included in your list of satisfied customers. Truly, it is amazing what your Thomas durable pump has done for our sand business.

Our Thomas dredge pump was purchased in August of 1958, and was put into operation in November of the same year.

Before installing your pump, we were putting in parts and making repairs every few weeks. Since the purchase of the Thomas we have had no maintenance problems. In fact, we have not, as yet, replaced a single part.

It is an extreme pleasure to be doing business with people such as yourself. Your Thomas pump has been everything you said it would be and even more.

Yours very truly,

SPANGLER & SONS, INC.

R. Patrick Spangler

R. Patrick Spangler

Top: R. Patrick Spangler, ready-mix concrete operator of Shelby, North Carolina.

Above: Mr. Spangler's letter describing his 2-years experience with a THOMAS Durable Dredge Pump.

Thomas Durable Dredge Pumps are manufactured in range of sizes from 6" to 16" discharge. Write or phone for additional information.

THOMAS FOUNDRIES Inc.

P. O. BOX 1111, BIRMINGHAM, ALABAMA

exemplary damages. In order that a recovery of exemplary damages may be sustained the plaintiff (Wooley) must show, not merely that the defendant (S.P.C. Company) could have, or ought to have, foreseen and prevented the loss or injury of which the plaintiff complains, but that he acted intentionally or willfully, or with a degree of 'gross negligence' which approximates a fixed purpose to bring about the injury of which the plaintiff complains.

"It can hardly be said that in looking to Wooley as the person immediately charged with responsibility for the safety of himself and those working in his department, the employer was consciously indifferent to his welfare and that of his fellow workers."

What Is an Accident?

Considerable discussion has arisen from time to time over the legal question: What is an "accident" which entitles an injured employee to recover compensation?

A review of numerous late and leading decisions discloses that the higher courts have adopted this law: An accident arises out of the employment when the required exertion producing the accident is too great for the man undertaking the work, whatever the degree of exertion or the condition of the workman's health. Otherwise there is no accident.

For illustration, in *Windust* v. *Glacier Sand and Gravel Company*, 323 Pac. (2d) 241, the testimony showed that an employee named Windust died at the age of sixty-one years while working for the Glacier Sand and Gravel Company as an operator of a ready-mix concrete truck. Further testimony showed that as a driver of the ready-mix concrete truck, one of his customary duties was to walk out on the catwalk on the side of the truck, step up about two feet and look into the drum to see how much concrete was in it. One day he fell dead just as he was stepping up to look into the drum.

In subsequent litigation, the higher court refused to award dependents of deceased Windust any compensation, under State Workmen's Compensation Act, saying:

SPECIFY...
DRILLING EQUIPMENT
WITH
BUILT-IN
QUALITY-DEPENDABILITY

YOU'LL END UP WITH THE PROFITS YOU'VE LOOKED FOR

Yes, you can buy ordinary drilling equipment and you'll probably save money... but in a short time the efficiency of the machine will drop, the rods will be worn and bent, the waterswivels will leak, the casing will be broken, the dependability you counted on will not be there. Instead, you'll be required to spend large amounts of money bringing comparatively new equipment back up to par.

If you are looking for drilling machinery and equipment that is built for Quality... not for Price, specify and purchase SPRAGUE & HENWOOD: dependable... efficient... proven in the field.

Write, giving full particulars on your problem, and the correct brochure or catalog will be sent to you immediately.

Look for our emblem... It's your Seal of Quality

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Nine-Unit Payhauler fleet *serves*

Eleven-second dumping with positive power-up, power-down control of body action is provided by the inverted, double-acting hoist system as furnished by International. For similar all-around cycle-speeding advantages in a 19-tonner, see the 65 Payhauler!

Florida Rock Products Corporation

Here are five of the nine 95 Payhauler rear-dumps owned by Florida Rock Products Corporation—hauling from quarry to crusher. Fleet operates in Hernando County, Florida.

"Our Payhauler units are doing everything we expected of them—and are performing very satisfactorily."—T. S. BAKER, *President*
Florida Rock Products Corporation

Florida Rock Products Corporation moves rock from quarry to crusher with a fleet of nine International Model 95 Payhauler rear-dumps. Payhauler offers an exclusive combination of capacity-adding, cost-reducing features of special appeal for tough, heavy, off-road mine and quarry hauling.

Of all 27-ton off-road haulers, only the 95 Payhauler gives you the ton-shedding, brawn-boosting advantages of the rock-ribbed corrugated body. Only the "95" is plus-powered by the 375-hp DT-817 turbocharged International diesel engine. Choose the "95" with power-shift torque converter or 9-speed air-shift transmission.

Grade charts prove that the "95" Payhauler is in a class by itself for upgrade hauling—giving a speed advantage of up to 44%! Compared to 27-ton competitors, only the "95" is "one hand" power-steered with International's high-leverage enclosed system—or is quick-dumped (in 11 seconds) with power-up, power-down inverted hoist action.

See for yourself in your own off-road hauling how an International Payhauler can increase your capacity, and give you record economy. Let your International Construction Equipment Distributor demonstrate.

International*® *Construction Equipment

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Illinois
A COMPLETE POWER PACKAGE

Enter 146 on card, page 177

MARION . . . a dependable and profitable partner
FOR HEAVY-DUTY HAULING

This heavy-duty, 10-yard Marion dump body is especially adaptable for use — in quarries . . . on construction sites . . . in and around gravel pits — wherever conditions are unusually severe and extra ruggedness is required for better off-the-road operations.

With this MD style body, contractors can take their choice of two types of extra strong, fast acting Marion hoists used for the dumping operation — a front mount telescopic hoist or an underbody, double arm hoist.

This combination of a heavy-duty Marion body and hoist has provided many owners throughout the country a dependable and profitable partner for their operations. It can do the same for you. We'd welcome the chance to give you all the facts.

MARION
BODIES AND HOISTS

MARION METAL PRODUCTS CO.
Marion, Ohio, U.S.A.

Enter 148 on card, page 177

"The cumulative effect of long continued routine and customary duties upon a workman, regardless of the hours devoted thereto, is not a sudden and tangible happening. A cumulative effect, however injurious, is noncompensable unless it constitutes an industrial disease, not here in issue. There was no 'sudden and tangible happening' of a traumatic nature producing an immediate or prompt result, and consequently operator suffered no 'injury' within contemplation of workmen's compensation act."

For comparison, see *Frandila* v. *Department of Industries,* 243 Pac. 5. There the workman, while engaged in digging a ditch, suddenly collapsed, and died. The testimony established that the workman was suffering from hardening of the arteries, and that he died from either a rupture of a blood vessel or from embolism. The higher court awarded compensation and held that the hardened arteries, coupled with overexercise in the course of the employment, caused either the hemmorrhage or embolism, and that the work being done was a definite and particular occurrence, which was a contributing, proximate cause of the death. The court then said:

" . . . an accident exists when a man undertaking work is unable to withstand the exertion required to do it, whatever may be the degree of exertion used or the condition of the workman's health."

Death Not Caused by Independent Contractor

Another reader asked this interesting question: "If an employer hires a legal independent contractor to do certain work is this employer relieved from all damage liability arising from the independent contractor's work?"

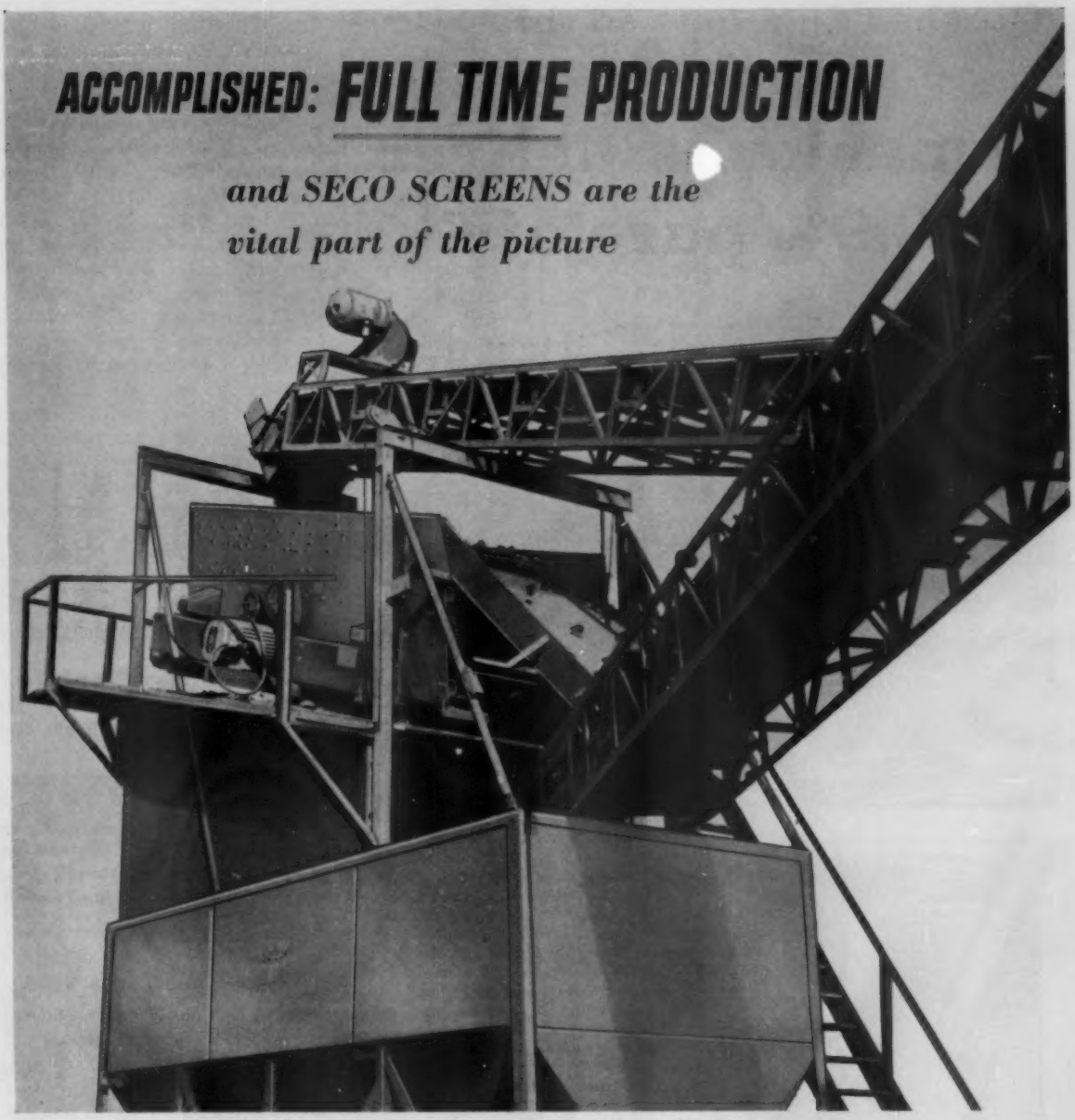
Generally speaking, the answer to this question is in the negative.

For example, in *Gulf Cement Company v. Grand Indemnity Company,* 149 Fed. (2d) 196, the testimony showed that a company carried an insurance policy by the terms of which the insurance company agreed to defend all suits, except suits for injury or death caused by an independent contractor.

The company contracted with an independent contractor, named Peterson, to erect and operate a pile

ACCOMPLISHED: FULL TIME PRODUCTION

and SECO SCREENS are the vital part of the picture



When you're operating double shifts or around the clock, you can't afford unscheduled work stoppages because of screen failures. Insure full time production as thousands of operators do by standardizing on SECO Screens. They're engineered with shafts and bearings of ample size for extra long life and dependable, day in and day out efficiency even under peak loads on the toughest screening jobs. Exclusive True Circular Action gives SECO Screens a sharper "whip" for more accurate screening results, more accuracy when the going is the toughest! SECO Screens . . . your key to top tonnages and top operating efficiency. Specify SECO the next time you add or replace screens.

SECO
PRODUCER PROVEN
VIBRATING SCREENS

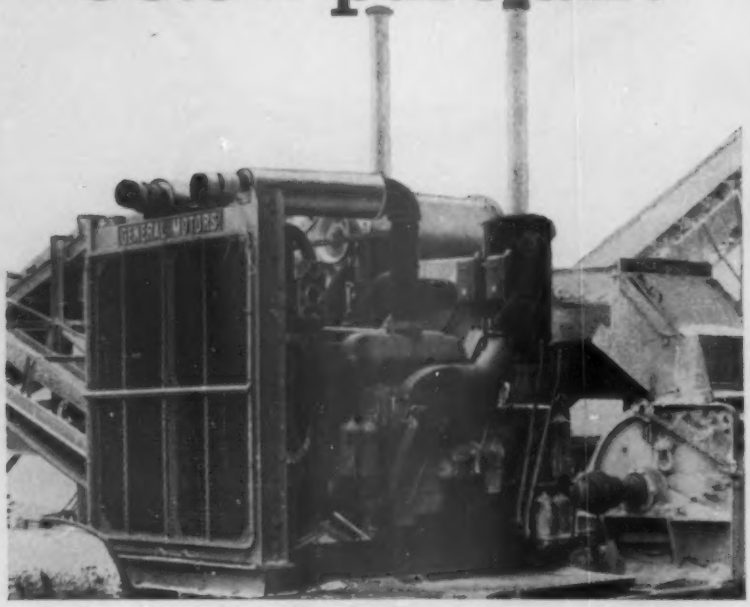
GET THE FACTS NOW

Write for 4-bearing catalog 3205 or Twin Bearing Booklet TB-21

SCREEN EQUIPMENT CO., INC.
Buffalo 25, N. Y.

Crusher dust gets so thick
you can't breathe . . . but

Donaclones deliver 99.9% pure air!



Now factory equipment on many leading makes of engines

Dust gets so thick around this ag limestone plant, it often hides the equipment. Diesel engines on crusher and hammermill used to require frequent overhaul with expensive downtime.

After Donaclones were installed, engines were operated according to the previous overhaul schedule and then examined. *They showed practically no signs of wear.*

The Donaclone's primary centrifugal cleaner removes 98% of the dust. Only 2% remains for the Duralife paper filter giving it an extra-long service life. And it can be renewed when necessary, by dunking in water and detergent.

Add years of engine life by modernizing with Donaclones.

Write for name of dealer

Side inlet model

Center tube model

Donaclone by Donaldson

666 Pelham Boulevard • St. Paul 14, Minnesota

Enter 150 on card, page 177

driver in certain construction work. Several employees of Peterson were either severely injured or killed, on the property of the company, when a deadly current of electricity jumped from high tension wires to the pile driver on which such employees were working.

The insurance company denied liability on suits filed against the company on the grounds that the insurance policy contained a clause which clearly relieved it from defending suits for injuries and death resulting from work done by any independent contractor.

The testimony showed further that (1) the pile driver belonged to Peterson and its erection was under his complete direction and control; (2) the pile driver was being erected by Peterson's own crew for the company; and (3) the power line was used for transmitting electric current to the cement plant for use of the company in the manufacture of cement.

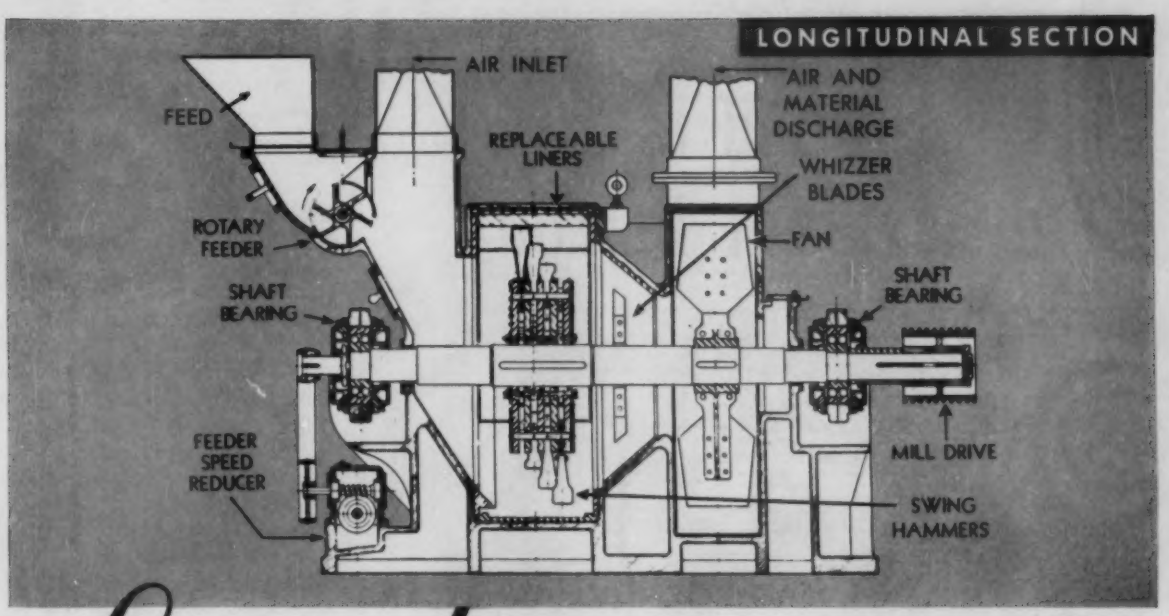
Notwithstanding the above clause in the policy, the higher court held the insurance company liable, and said:

"Undoubtedly, the work was being done by, and the men were under the supervision and control of, an independent contractor. But the injuries and deaths were not 'caused by' the *work* of the independent contractor."

Amended Application Valid

Recently a higher court rendered an important decision which answers a long debatable legal question, as follows: "If an injured employee files an amended petition or application, after the time specified by state laws for filing claims for compensation under the State Workmen's Compensation Act has elapsed, can the employee recover compensation on the basis of the amended petition or application?"

This higher court held that where a petition or application for compensation is final but with insufficient detail, and the additional allegations of an amended petition are only an enlargement and amplification of the averments of the original by setting out more definitely that which was previously imperfectly stated, and do not set up a new matter, the fact that the statute of



Raymond's RUGGED IMP MILL

THE MULTI-PURPOSE GRINDING UNIT

GRINDING • BLENDING • SEPARATING • CONVEYING • DRYING

⚹ DESIGNED FOR FINE GRINDING

The Imp Mill is particularly intended for medium fine and fine grinding of softer non-metallic minerals and many manufactured products. Wide usage of the Imp Mill is made in a great many fields where pulverizing is desired.

⚹ VERSATILITY OF APPLICATION

Mills are built in a variety of types and sizes to produce many different capacity requirements. They have a wide degree of adjustment of product fineness, ranging from about 20 mesh to 325 mesh, depending upon material handled.

⚹ NEED OF CLASSIFIER

For higher finenesses or more uniform finished products than the Imp Mill would normally produce, an air classifier may be used. Either an integral Whizzer Separator or a Raymond Mechanical Air Separator could be installed according to the particular type of operation needed and the material to be processed.

⚹ FLASH DRYING

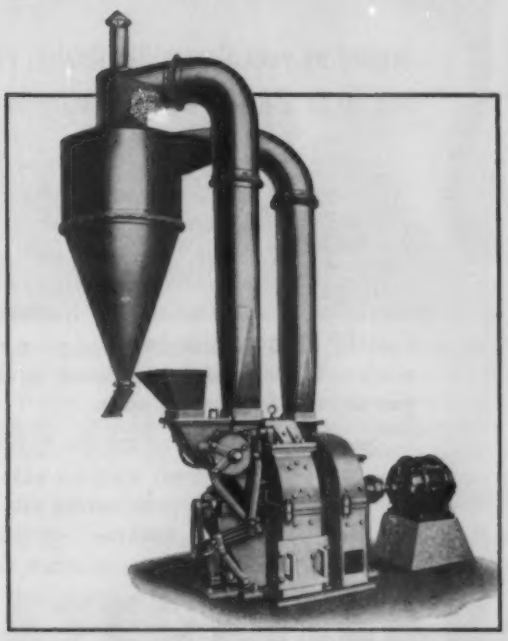
The basic design of the Imp Mill readily adapts itself to the simultaneous drying and pulverizing of materials. The Mill utilizes heated air or products of combustion for removing surface moisture and, in special cases, chemically combined water from materials during grinding. In all instances air is used as the conveying medium.

⚹ FLEXIBLE IN INSTALLATION

Each Mill System is a compact installation, engineered to fit most any plan or layout. The floor space is held to minimum requirements of Mill and Drive Motor. Piping variations permit cyclone collector, within limits, to discharge material where needed. Systems are completely enclosed from feed hopper to finish bin.

⚹ DUSTLESS OPERATION

The excess air is diverted to a secondary collector or, where permissible, can be exhausted to the atmosphere.



FOR FURTHER DETAILS ON THIS AUTOMATIC UNIT WRITE FOR RAYMOND IMP MILL CATALOG NUMBER 87 Q

COMBUSTION ENGINEERING, INC.

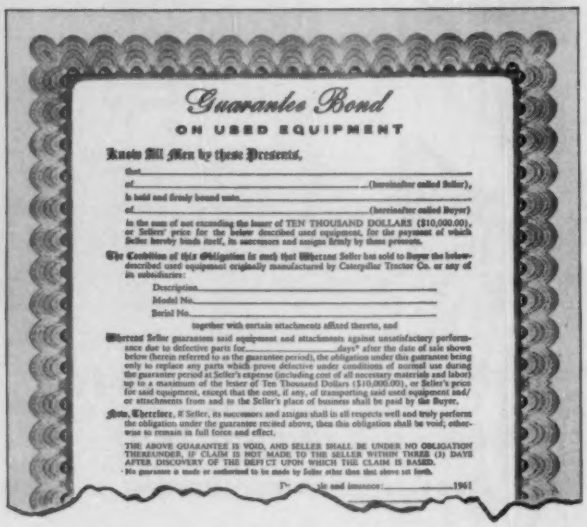
Raymond Division

Combustion Engineering-Superheater Ltd.
Montreal, Quebec, Canada

427 WEST RANDOLPH STREET • CHICAGO 6, ILLINOIS

Sales Offices in all Principal Cities

This Bond Is an Investment in You



Guarantee Bond

ON USED EQUIPMENT

Know All Men by these Presents,

that _____

of _____ (hereinafter called Seller),

is held and firmly bound unto _____

of _____ (hereinafter called Buyer)

in the sum of not exceeding the lesser of TEN THOUSAND DOLLARS ($10,000.00), or Sellers' price for the below described used equipment, for the payment of which Seller hereby binds itself, its successors and assigns firmly by these presents.

The Condition of this Obligation is such that Whereas Seller has sold to Buyer the below-described used equipment originally manufactured by Caterpillar Tractor Co. or any of its subsidiaries:

Description _____

Model No. _____

Serial No. _____

together with certain attachments affixed thereto, and

Whereas Seller guarantees said equipment and attachments against unsatisfactory performance due to defective parts for _____ days* after the date of sale shown below (herein referred to as the guarantee period), the obligation under this guarantee being only to replace any parts which prove defective under conditions of normal use during the guarantee period at Seller's expense (including cost of all necessary materials and labor) up to a maximum of the lesser of Ten Thousand Dollars ($10,000.00), or Seller's price for said equipment, except that the cost, if any, of transporting said used equipment and/or attachments from and to the Seller's place of business shall be paid by the Buyer,

Now, Therefore, if Seller, its successors and assigns shall in all respects well and truly perform the obligation under the guarantee recited above, then this obligation shall be void; otherwise to remain in full force and effect.

THE ABOVE GUARANTEE IS VOID, AND SELLER SHALL BE UNDER NO OBLIGATION THEREUNDER, IF CLAIM IS NOT MADE TO THE SELLER WITHIN THREE (3) DAYS AFTER DISCOVERY OF THE DEFECT UPON WHICH THE CLAIM IS BASED.

No guarantee is made or authorized to be made by Seller other than that above set forth.

Executed at _____ sale and issuance: _____ 1961

Signed by your Caterpillar Dealer, this bond gives you up to $10,000 worth of machine dependability

Bonded Buy means guaranteed machine dependability. You can get a completely-checked, used Cat-built machine that has the Cat Dealer's confidence and guarantee, PLUS this bond from Lumbermens Mutual Casualty Company that backs up your machine with as much as $10,000 worth of parts and labor for the period you and the dealer agree upon.

See your dealer. Read the bond. Check the details. This guarantee can apply on your next used machine. And you pay no extra premium for this assurance. Dependable Bonded-Buy machines are priced right—and your Cat Dealer offers terms to match your needs. Call him or see him soon. Do business with the man whose business is built on dependability.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Enter 152 on card, page 177

limitations has run out when the amended petition is filed is not a bar to recovery.

For instance, in *Miller* v. *B.O.D.C. Products,* 318 Pac. (2d) 1072, the testimony showed facts as follows: The B.O.D. Concrete Products was taking part in the construction of certain storage bins. One day as Miller passed by a paving machine owned and operated by the B.O.D. Concrete Products, he was struck on the left side of his head and back by the loading bucket of the paving machine, and was severely injured.

Miller filed an application within the period required by a state law. This claim was filed for compensation under the State Workmen's Compensation Act. After the statute of limitations period had expired he filed an amended petition or application which stated that in view of a total of $956.00 for medical and hospital bills, and other reasons he has a legal right to recover $67,032.12.

It was argued that since Miller had filed the amended petition or application after the statute of limitation period had expired his amended petition could not be considered.

However, it is interesting to observe that the higher court approved the commission's decision awarding Miller compensation, although the intermediate lower court reversed the commission. This higher court said:

"The second amended petition merely tended to show the proper plaintiff (Miller) and related back to the first amended petition. Moreover, the amended petition did not set up a new cause of action. This could be shown by amending the original petition, and such amend- would relate back to the commencement of the suit or action."

CHECK LEGAL DECISIONS

each month for discussion of litigation applicable to the industry.

Enter 153 on card, page 177 →

19 tons of sub-base material loaded in 1.4 minutes!

To be exact, 19.75 tons of 3000 lb./yd. material loaded in that truck in 1.4 minutes. No one-time-only shot either. Another example: five trucks loaded out one after the other in 1.3 minutes each with an average of 17 tons per truck. That's routine production for the Caterpillar 966 with 2¾ yd. bucket at the Nello L. Teer quarry near Durham, N. C.

Can your loader match that? This 966 operator said, "I can load up to 100 tons an hour *more* with the 966 than with our other loader with a bigger bucket."

Reasons: "It's the fast lift and drop of the bucket. fast steering and short turning radius, fast power shift transmission and the automatic bucket positioners." There are hard mechanical reasons behind that performance testimony. The hydraulic system is fast because the pump is driven directly from the engine, is little affected by the load on the drive train. Finger-touch power shift transmission shifts from forward to reverse, first and second, almost instantly and *smoothly*.

If low production is your big problem, talk to your Caterpillar Dealer. Take a look at the Caterpillar line of wheel loaders—80 HP 922, 105 HP 944 and the 140 HP 966 (all flywheel ratings) . . . bucket sizes from 1¼ to 4 yd. Try a Cat loader on your job, see the easy operation, check the production, remember Cat dependability. Do you know anything that can beat that combination?

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

WHY THE BUCKET'S FASTER: It's going up automatically, will stop and hold at full height—while the operator is backing out and pulling up to the truck. After the load is dumped automatic bucket positioners take over again and tilt the bucket back to proper digging angle—and the operator is free to maneuver the loader. It's all part of the fast-operating control system—power-boosted steering and brakes, power shift transmission.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

CAT WHEEL LOADERS ARE SETTING NEW PRODUCTION RECORDS

TANKS

fabricated by

KIRK & BLUM

Tanks . . . of every type!

- **Large or small—one or one thousand**
- **Welded steel, aluminum, stainless or other alloys**
- **Open or enclosed . . . for process or storage**
- **Lined or unlined: Rubber, lead or plastic lined for corrosive materials**

For every tank requirement, you can depend on Kirk & Blum's 50 years of experience to fabricate to your specifications . . . and deliver to your schedule.

WRITE for Bulletin #F-3, or send your prints for prompt quotation.

THE KIRK & BLUM MANUFACTURING COMPANY
3112 Forrer Street • Cincinnati 9, Ohio

Enter 154 on card, page 177

United States Gypsum Plants Match Own Safety Mark

For the second time in three years, all United States Gypsum Company plants worked a full month without a lost-time injury. In January, a total of 1,750,000 man-hours worked without a lost-time accident was recorded for 66 plants and warehouses; reportable injuries were only one-half the number recorded in December.

Comparably, in May, 1958, all plants were completely free of lost-time injuries, and in 1959 the company established the best safety record in its history, with 34 of its 59 plants enjoying perfect safety records.

At the end of January, one plant (East Chicago, Ind.) had passed the 3,000,000 man-hour mark without a lost-time injury.

Ideal Cement Merit Awards Won by 3 High School Seniors

Three outstanding high school seniors, two boys and girl, have been named winners of the Ideal Cement Company National Merit Scholarships for 1961.

The winners are Linda Jean Clark, Ft. Collins, Colo., Claude Roger Riley, Knoxville, Tenn., and Robert Ewing Price, Little Rock, Ark.

The Ideal merit scholarship includes a stipend for the winner, as well as a grant to the chosen university or college. Scholarships are valued up to $6,000.

The new plant of Buildex, Inc., which maintains headquarters in Ottawa, Kans., is now under construction near Marquette, Kans. Products of the new facility will be aggregates for use in concrete and roofing granules.

Mountain Sand and Gravel Company, Great Barrington, Mass., has been sold to Mr. and Mrs. William H. Packham by Ernest J. Scarpa and Carl Shirley. This concern was founded in 1934 by the late G. A. Pelligrini and R. K. Wheeler. It was acquired by Messrs. Scarpa and Lee in 1957.

Enter 155 on card, page 177 →

Greater power, faster pace produce more tons per day

Forty engine horsepower gives the John Deere "1010" Crawler-Loader the kind of performance needed to keep trucks moving, hoppers filled, conveyors operating at capacity.

Efficient operating controls give you full benefit of the unit's work capability. Hydraulically operated direction reverser with wet clutch saves time and effort, eliminates clutching and gear-shifting from forward to reverse, provides a reverse to match every forward speed. Same wet-clutch packs soak up shocks to the transmission, extend machine service life.

One lever controls all functions of loader operation—digging, lifting, dumping. Dump clearance of over 8 feet, breakout force of 8,500 pounds and full-height lift of 4,000 pounds make the "1010" Crawler-Loader a profit-producer for operations of nearly every size. Gasoline or Diesel options match "1010" power to your spread.

Purchase may be made on terms of the John Deere Credit Plan or long-term leasing arranged through the John Deere dealer. For information, locate your John Deere dealer through the yellow pages of your phone directory now, or write John Deere, 3300 River Drive, Moline, Illinois.

JOHN DEERE

LOADERS
BULLDOZERS
AND
MATERIAL
HANDLING
EQUIPMENT

Manufacturers' News

Fairbanks, Morse & Co., Chicago, Ill., has purchased the assets of the Herold Radio and Electronics Corporation, Yonkers, N.Y.

The acquisition gives the company, which is a major industrial component of Fairbanks Whitney Corporation, additional manufacturing equipment for its Electronics Division and a leasehold on a recently built 120,000-square-foot plant and office building in Yonkers. Purchase price was not disclosed.

The headquarters of two Fairbanks, Morse operating divisions—the Electronics Division and the Scale Division—will be consolidated at the Yonkers site and a number of general administrative functions of the company will also be centered there.

ROLAND J. KALB, formerly president of Herold Radio, has been named vice-president and group executive in charge of the two divisions.

A group of Herold Radio Corp. executives, engineering-research, and administrative personnel are being retained in the Fairbanks, Morse organization.

A reorganization of the sales department at the national level has been announced at Mack Trucks, Inc., Plainfield, N. J., by ALBERT G. CROCKETT, general sales manager. The objective is to give field personnel more freedom of action at the local level.

Two key changes have been made. One is elimination of the practice of directing branch sales through the eight regional divisions and the other is separation of the company's larger distributors from branch control.

All branches will now report directly to the home office and will be supported in the field by six regional managers of branch operations. The latter are newly created posts. The company's larger distributors will be supervised and assisted by 13 zone managers, also new positions.

CARL K. REVELLE has been named manager, Distributor Sales Division, with headquarters in Plainfield. He was formerly manager of the Western Division.

E. H. DILLOW, formerly Detroit branch manager, will head the newly created Branch Sales Division.

WALLACE HALLAM has been named manager of field operations, with responsibility for both the Distributor Sales Division and the Branch Sales Division. He had previously been manager of the Atlantic Division.

EDGAR J. BERSHEIM has been appointed supervisor of the testing laboratory for the Pennsylvania Crusher Division of Bath Iron Works Corporation, West Chester, Pa.

Mr. Bersheim previously had been associated with the Franklin Institute Laboratories for Research and Development in Philadelphia, Pa.

As a part of the National Merit Scholarship Corporation program, the General Tire Foundation will award four scholarships each year to children of employees of The General Tire & Rubber Company and its domestic subsidiaries, it was announced recently by M. G. O'NEIL, president.

Eligible to compete for the scholarships are any children, natural or adopted, of employees of The General Tire & Rubber Company, Aerojet-General Corporation, RKO General, Inc., A. M. Byers Company, and any of their domestic subsidiaries.

C. F. GRUMLEY has been promoted to the position of corporate director of purchasing and traffic of the J. I. Case Company, Racine, Wis. Mr. Grumley fills the position vacated by H. J. MAUBERT, vice-president of corporate purchasing and traffic, who resigned in order to join the research and consulting firm of Arthur D. Little, Inc., of Boston, Mass.

Mr. Grumley joined the Case Company in 1942 as a buyer in central purchasing in Racine. Most recently he was manager of purchasing at the Clausen Works.

B. R. GETMAN replaces Mr. Grumley as manager of purchasing at the Clausen Works.

Mr. Getman, who is being transferred from the Churubusco plant, was employed by the American Tractor Company in 1956 as purchasing agent and became a part of the Case organization at the time of the merger of the two companies.

JOHN J. MCGLONE has been elected vice-president, sales, of The Wellman Engineering Company, affiliated companies with headquarters in Cleveland, Ohio. The position is newly created. Prior to this appointment Mr. McGlone has been Chicago district manager for both companies. He joined the Williams Bucket Division of Wellman in 1955.

J. J. McGlone

ROBERT F. HOHMAN, chief engineer of Merrick Scale Manufacturing Company, Passaic, N. J., died recently at the age of 69.

Mr. Hohman was considered a world authority on in-transit weighing and gravimetric feeding of bulk materials.

Three executives have been appointed to new positions upon the retirement of two vice-presidents at Caterpillar Tractor Co., Peoria, Ill.

GAIL E. SPAIN, who had administrative responsibility for foreign marketing, and HENRY H. HOWARD, who had been in charge of the Engine Division, are retiring.

Mr. Spain joined Caterpillar in 1929 and was elected a vice-president in 1942. For nearly 20 years,

Enter 157 on card, page 177 →

Get high output at low cost with New 2010 Wheel Power

Most recent addition to the John Deere Wheel Loader line, the 52-engine-h.p. "2010" is ready to bring new economies to sand and gravel operations. This new loader offers top performance at low cost on truck loading, hopper and conveyor feeding and cleanup work. Efficient 4-cylinder gasoline or Diesel engines, new constant-mesh transmission and full power steering put new push behind any job.

The heavy-duty loader features self-leveling bucket with single-lever control of all actions. Bucket level indicator, 30-degree roll-back at ground level, and an instant-response hydraulic system assure fast cycle time. Auxiliary left-hand shift lever speeds direction reversing.

Built for efficient work with all standard trucks, the heavy-duty "2010" has a dump clearance of seven feet, ten inches, and a reach of over 29 inches. Breakaway lift is 5200 pounds, and full height lift, 3700.

For additional specifications, facts on the John Deere Credit Plan, and a demonstration, contact your John Deere dealer now through the yellow pages of the telephone directory.

John Deere, 3300 River Drive, Moline, Illinois.

JOHN DEERE

LOADERS
BULLDOZERS
AND
MATERIAL
HANDLING
EQUIPMENT

he has been administrative head of domestic or foreign marketing and sales development activities.

Mr. Howard joined Caterpillar 35 years ago, became manager of the Engine Division when it was formed in 1953, and was elected a vice-president in 1954.

W. J. McBrian

W. J. McBRIAN succeeds Mr. Spain and also becomes president of the subsidiary companies, Caterpillar Americas and Caterpillar of Delaware. Since 1956 Mr. McBrian has been chairman and managing director of Caterpillar Tractor Co. Ltd., the company's subsidiary in Great Britain.

LEE L. MORGAN will succeed Mr. Howard as vice-president in charge of the Engine Division, and also assume administrative responsibility for the company's defense products department. Since joining the Company in 1946, Mr. Morgan has supervised various advertising, sales and sales development functions. He was named manager of sales development in 1958.

E. C. Chapman

Lee L. Morgan

E. C. CHAPMAN, assistant sales development manager, will succeed Mr. Morgan as manager of sales development. Mr. Chapman has been with Caterpillar since 1945, and has held a variety of sales and advertising positions since that date.

ADRIAN E. ROSS, president of Sprague & Henwood, Incorporated, recently announced the opening of a southwestern branch located at 3536 Gulf Link Road, Tucson, Ariz. BILL B. WILLIAMS, who formerly served as superintendent in the western regional district office, Grand Junction, Colo., was appointed manager. He has been associated with the company for over 18 years and he has accumulated a wide experience in all phases of diamond drilling.

KEITH T. MIDDLETON was elected president of The Fafnir Bearing Company, New Britain, Conn., at the annual directors meeting. Mr. Middleton joined the company in 1952 as assistant secretary and legal counsel. He succeeds CLARENCE G. ROSENSWEIG who was elevated to vice-chairman of the board. Mr. Middleton was formerly executive vice-president and secretary.

Mr. Rosensweig's post is a new one. He will work with Mr. Middleton and board chairman STANLEY M. COOPER, who continues as chief executive officer.

J. T. PITTS has been named sales manager of the Brown Instruments Division of Minneapolis-Honeywell Regulator Company. Mr. Pitts has held a variety of field sales management posts, most recently as southwest regional manager.

He succeeds J. A. ROBINSON, who joins the company's six-division Industrial Products Group to coordinate expanding activities in the metals producing areas.

Three executive appointments have been annonnced at Davey Compressor Co., Kent, Ohio.

L. W. DARLING, formerly general sales manager, was named director of marketing. Affiliated with Davey for 14 years, Mr. Darling was previously manager of government sales, district manager of the Davey Chicago office, and New England district manager.

C. E. FLORA succeeds Mr. Darling as general sales manager. He has been manager of industrial sales for the last five years.

G. B. EDGELL has been appointed director of operations. He has been a member of the Davey organization since 1940. Mr. Edgell was formerly manager of the engineering department.

R. B. PARK has been been appointed sales manager, industrial rubber and mechanical packings for Raybestos-Manhattan, Inc., Passaic, N. J. Mr. Park has been assistant sales manager of these sales activities since July, 1959. He was formerly district manager in San Francisco having joined Raybestos-Manhattan in that city in 1954 after an extensive background in the distribution of industrial supplies.

R. B. HAZARD, previously vice-president and sales manager, industrial rubber and mechanical packings, has now been appointed vice-president, sales for these sales divisions of the firm. He was elected a director in October, 1960.

L. H. BRANNIAN has been appointed district sales representative in Texas for Euclid Division of General Motors Corporation. He replaces Alex A. Speer, a 15-year veteran with Euclid who is retiring due to ill health.

Mr. Brannian moves to Texas from Fargo, N. D., where for the past 5 years he has been a sales representative for Euclid.

ERNEST H. PEABODY was elected chairman of the board and ERIC G. PETERSON was elected president at a recent meeting of the board of directors of Peabody Engineering Corporation.

Wheelabrator Corporation of Canada, Ltd., a newly formed Canadian company, is the successor to the Canadian division of Wheelabrator Corporation of Mishawaka, Ind., and was organized to handle expanding sales and fabricating activities of airless blast cleaning equipment, abrasives, and dust and fume collection systems for all provinces in Canada. The plant is in Scarborough, Ont., and an office is maintained in Montreal, Que.

HAROLD M. MILLER is president and ROBERT A. CAMPBELL is vice-president and general manager in charge of Canadian operations. J. D. LAMB is general sales manager.

"A Real Rugged ROCK BRUISER"

. . . say field reports on this 1½-yd. BAY CITY Model 72 shovel. It's one of two owned by the Valley Forge Stone Co., Malvern, Pa. This firm switched to BAY CITY after owning competitive makes for over 15 years.

From the treads up, the BAY CITY 72 is a heavy-duty rig with proven high output performance in tough rock. Look first at the lower works. The unit-cast, heat treated, alloy steel base assembly is welded to sturdy H-beam axles and bolted firmly to long, wide crawler frames. Dependability is the keynote throughout. Move up to the heavy-duty alloy steel rotating base casting. It provides a firm, solid foundation for deck machinery and engine . . . is strongly ribbed and cross braced . . . amply withstands the shock and vibrations of tough rock digging. The hoist and front drum assemblies are packed with power features such as helical gear drive, ball bearing-mounted drums and shafts, and large diameter, power booster clutches.

And, the BAY CITY 72 gives you a shovel front that's always ready for heavy digging. With the rock-type dipper actuated by a one-piece continuous chain, crowd action is positive and independent. Reverse crowd is power operated, providing complete control under all conditions of the digging cycle. Easy, in-the-field convertibility to dragline and clamshell adds versatility to your loading operations.

Your BAY CITY dealer has more Model 72 facts. Ask him for the illustrated Series 70 catalog containing information on design and construction features, and for copies of specification and working range bulletins. Do it soon!

BAY CITY SHOVELS, INC.
2611-E Center Ave.
BAY CITY, MICHIGAN

a subsidiary of Unit Crane & Shovel Corp.

The sales organization of the Multiwall Bag Division of Owens-Illinois Glass Company, Toledo, Ohio, has been expanded by the addition of three new sales representatives.

ALVIN L. WISTERT has been assigned to the western sales region with headquarters in Chicago. Mr. Wistert, who had been an All-American tackle in 1948 and 1949 at the University of Michigan, has been in industrial sales work in Detroit for the last six years.

WILLIAM E. WEHNER JR. has been named to a new sales territory covering southern Ohio, southern Indiana, and Kentucky, with headquarters in Louisville, Ky. For the last seven years Mr. Wehner has been doing multiwall bag sales work in Atlanta.

KENNETH LAMONTAGNE has been assigned to the eastern region in New York. Mr. Montagne, former owner of the Valdosta Millwork and Cabinet Company moves to New York from the Georgia city, location of an Owens-Illinois manufacturing facility.

KENNETH W. NELSON has been named a regional sales manager for Thor Power Tool Co., Aurora, Ill.

Mr. Nelson will establish headquarters at Thor's branch office in Long Island, New York. His sales territory will extend from the Carolinas north through the New England states.

Prior to this appointment Mr. Nelson has been a Thor sales and service engineer in the Chicago area since 1952.

Fairbanks, Morse & Co.—a major industrial component of Fairbanks Whitney Corporation—will begin immediate expansion of its diesel engine line through an international marketing agreement with W. H. Dorman & Co., Ltd., of Stafford, England, it was anounced recently by DAVID KARR, Fairbanks Whitney president.

The agreement, for a 20 year period, will enable Fairbanks Morse to introduce a new range of small, high speed diesel engines in the United States.

Two district sales managers have been appointed recently for Hewitt-Robins Incorporated, Stamford, Conn.

J. E. VAN STONE has been named Cleveland district manager. He was formerly in charge of sales in the Salt Lake City area.

R. S. Schuba

J. E. Van Stone

R. S. SCHUBA has been appointed Detroit district manager. He had previously been in charge of sales in Louisville, Ky.

H. E. KRUSE has been named director of product training, working particularly with industrial distributors and dealers on construction equipment products. Mr. Kruse joined Oliver in 1936 as a salesman in its Oakland branch.

Expansion of warehouse and distribution facilities in San Francisco, as the result of substantially increased sales in that area, is announced for The S. K. Wellman Company, Bedford, Ohio. On June 1, the company occupied a new 21,000 sq. ft. building at 508 South Airport Blvd., South San Francisco which will be approximately twice the size of present headquarters.

JOHN R. JONES has been appointed manager, new product development for The Alpha-Molykote Corporation, Stamford, Conn. In this position Mr. Jones will be responsible for the development of new lubricants.

Mr. Jones comes to Alpha-Molykote from the Boeing Airplane Company where he has been materials engineer in charge of fuels, lubricants and hydraulic fluids in the Transport Division. Recently, for Boeing, he has been coordinating the study of friction in a vacuum being conducted by the Franklin Institute.

LLOYD SKAGGS of Houston, Texas, has joined the staff of TRW Computers Company, a division of Thompson Ramo Wooldridge Inc. Mr. Skaggs will be responsible as district sales manager for the application and sales of control computer systems in the southwest region, with his headquarters office in Houston, Tex.

Prior to joining TRW Computers Company he was in charge of technical computing for Cosden Petroleum Corporation.

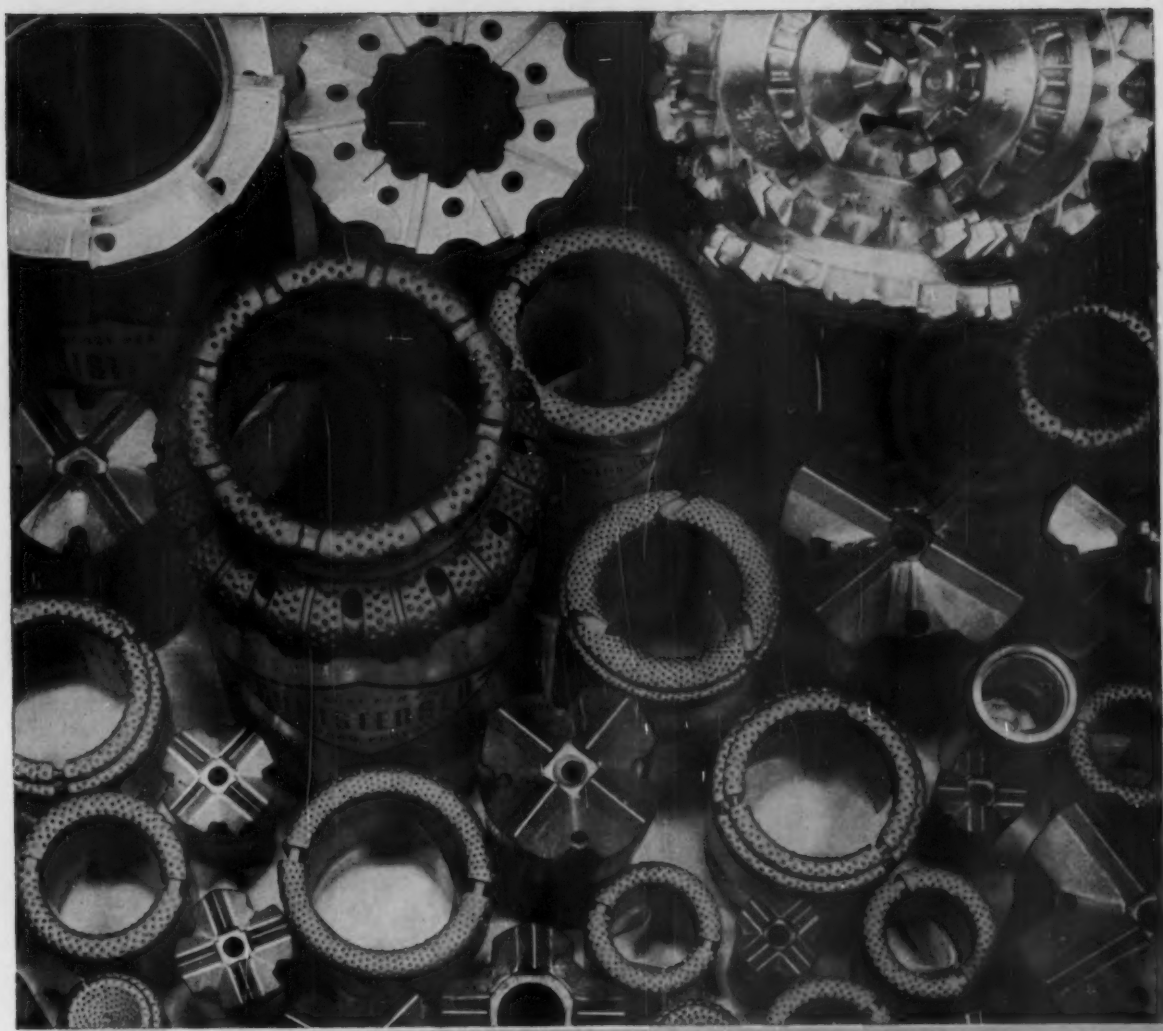
ROBERT L. SEARS has been named manager of construction and industrial sales for Barnes Manufacturing Company, Mansfield, Ohio.

Valley Truck Equipment Company, P. O. Box 165, U. S. 66 at Highway 141, Valley Park, Mo., is a new distributor for the New Leader line of Highway Equipment Company, Cedar Rapids, Iowa.

The new distributor serves in 23 counties in Missouri and Illinois in the vicinity of St. Louis.

Meissner Industrial Supplies, Inc., located at 1307 Indiana Street, Wichita Falls, Texas, has been appointed a new distributor for the Boston Woven Hose & Rubber Division of the American Biltrite Rubber Co., Boston, Mass.

RICHARD G. GENTON has joined Wheelabrator Corporation, Dust and Fume Control Division, Mishawaka, Ind., and has been assigned to a three-state territory including California, Nevada, and Arizona. He will serve as regional dust and fume engineer, operating from Wheelabrator's Los Angeles and San Francisco offices.



If your problem is making hole . . .

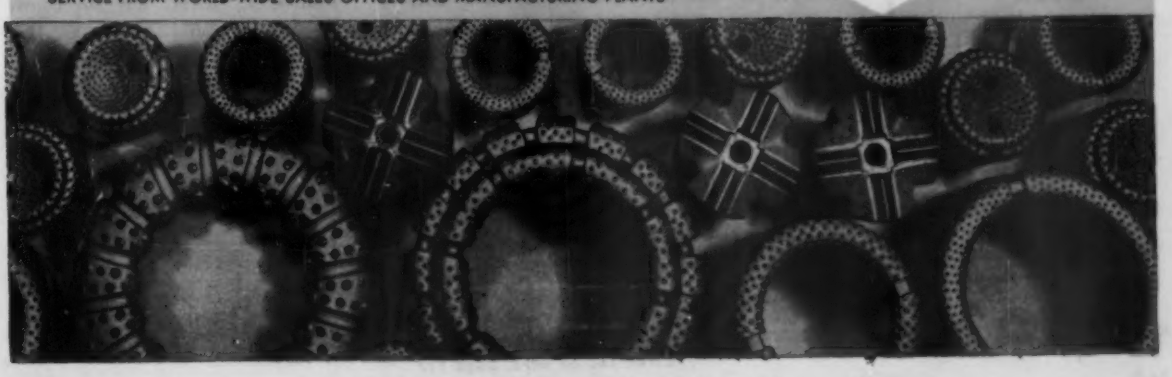
. . . Christensen offers a complete line of diamond bits, reaming shells, and core barrels. Also available are tungsten carbide and roller cone bits. When you need "complete" custom bit service, contact Christensen.

"Less cost per foot"

CHRISTENSEN DIAMOND PRODUCTS

MAIN OFFICE AND PLANT 1937 SOUTH 2nd WEST
SALT LAKE CITY, UTAH

SERVICE FROM WORLD-WIDE SALES OFFICES AND MANUFACTURING PLANTS



O. W. KRAMER, chief metallurgist of Columbia Steel Casting Company, Portland, Ore., and WILLIAM A. SNYDER, associate professor of mechanical engineering at the University of Washington, were honored at the annual meeting of the Steel Founders Society of America at the Drake Hotel in Chicago, for their prize winning technical paper, *The Use Of Olivine Sand for Molds and Cores.*

The prize winning paper describes the improvement in the finish of manganese steel casting, and savings in cleaning the casting when molds of olivine aggregate were used.

WILLIAM D. MESSER was named general sales manager for Leschen Wire Rope Division, H. K. Porter Company, Inc., St. Louis, Mo. He was formerly sales manager, Construction Division of Huck Mfg. Company, Detroit, Mich.

Mr. Messer was a bridge engineer for the state of Illinois and a consulting structural design engineer.

R. REX HARTUP, former general sales manager, has been appointed technical manager, prestressed materials.

GEORGE S. HARVEY, West Hampstead, N. H., a multiwall bag salesman who has long been active with the National Limestone Institute's Manufacturers' Division has retired as a director of the institute.

Mr. Harvey, who covers the New England area for the Multiwall Bag Division of Owens-Illinois Glass Company was awarded a plaque at the National Limestone Institute's recent 16th annual convention in Washington, D. C., for service as 1958 chairman of the association's Manufacturers' Division.

Mr. Harvey, who has more than 30 years experience in multiwall bag sales, was replaced on the NLI Manufacturers' Division Board by FRANK M. CANNON, eastern regional salesman for Owens-Illinois' Multiwall Bag Division.

JOHN H. MANGLE has been elected vice-president in charge of operations for the Oliver Corporation Chicago, Ill., by Oliver's board of directors.

J. H. Mangle

Mr. Mangle has worked with Oliver since November, 1960, in its transition to a wholly owned, separately operated subsidiary of The White Motor Company, of which he has been assistant executive vice-president for the last six months.

The Oliver Corporation has reestablished its construction equipment sales organization as a separate Industrial Division.

S. F. Beatty

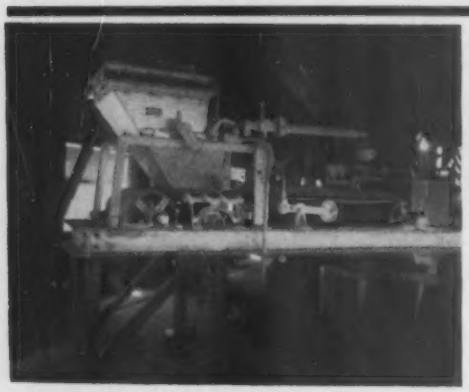
S. F. (Pete) BEATTY has been named manager of the division. Mr. Beatty will supervise the division's branch sales specialists and will be responsible for improving and expanding Oliver's industrial distributor organization.

New distributors for Hydro-Line Manufacturing Co., Rockford, Ill., are Lax Industrial Products, Cleveland, Ohio, and Sturgis Equipment Company, St. Louis, Mo.

H. W. BOTTEN, president of The Owen Bucket Company, Cleveland, Ohio, has announced three personnel changes at the company.

FRANK J. SZABO has been appointed comptroller. Mr. Szabo has been with the company for 19 years in the financial department. Mr. Szabo has also been named secretary-treasurer of the Clamshell Bucket Sales Corp., and the Owen Clamshell Warehouse Corp., both at New York, N.Y., subsidiaries of The Owen Bucket Company. He will continue to be located in Cleveland.

W. H. BOTTEN has been appointed vice-president and treasurer of The



a SCHAFFER POIDOMETER can be YOUR EFFICIENCY EXPERT with OUTSTANDING OPERATING ECONOMY

OVER **1600** SERVING BULK MATERIALS PLANTS

★

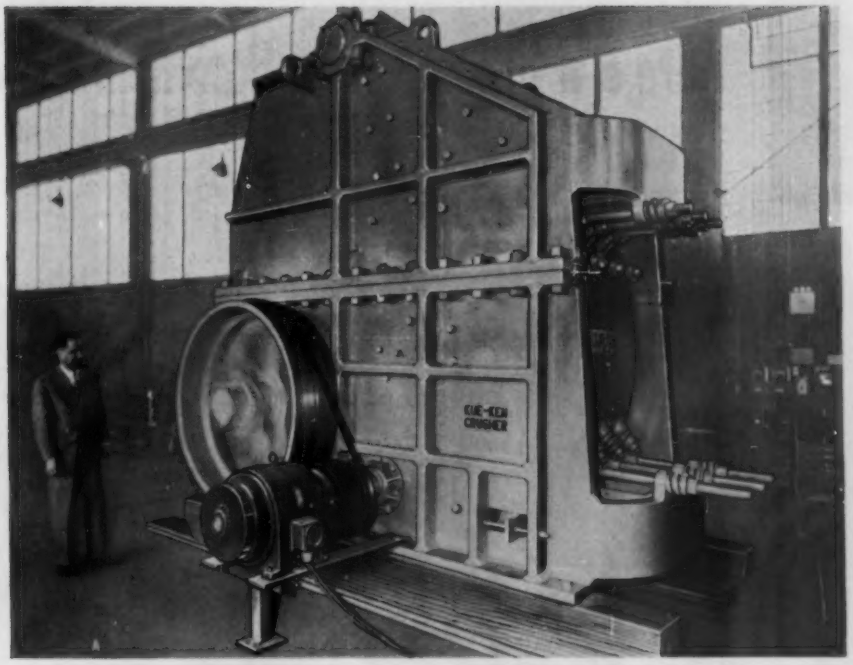
WRITE FOR COMPLETE DETAILS AND CATALOG NO. 5

Simple to operate—set the remote control devices and the Schaffer Poidometers will WEIGH—BLEND—FEED—MIX—RECORD and PROPORTION with the greatest accuracy.

It's automatic in operation—it's a smooth operating machine and assures efficiency at high-speeds.

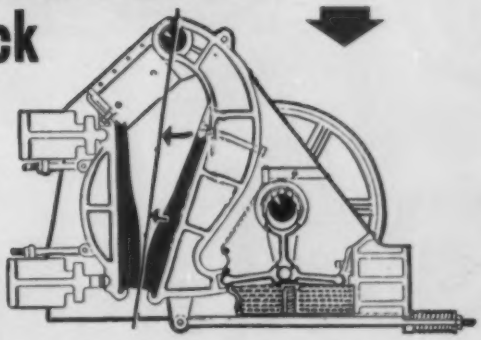
Schaffer Poidometer Co.
2828 Smallman St. Pittsburgh 22, Pa.

•Enter 162 on card, page 177



The four KUE-KEN jaw plate sections of the massive 48" x 42" KUE-KEN (left) are reversible and interchangeable for maximum utilization. KUE-KEN "crushing without rubbing" lengthens jaw plate life at least 5 times! The pendulum type jaw supported on a stationary hinge pin in center line of the crushing zone swings in an almost straight line to crush rocks squarely without rubbing. This eliminates the main cause of premature jaw plate wear with conventional crushers. With KUE-KEN, jaw plates cease to be a major maintenance and downtime factor.

KUE-KEN®... the hard rock crusher with 5-way power savings



Economy in power consumption is a major factor in Kue-Ken lowest cost per ton crushing. This high speed, high capacity crusher is specially designed so that every working part operates smoothly and efficiently. Kue-Ken is a precision machine designed and engineered with these power saving features:

1. Operating on the patented "crushing without rubbing" principle, Kue-Ken utilizes power to crush rock and not to wear out jaw plates.
2. Kue-Ken pendulum type swing jaw eliminates lifting heavy unbalanced parts. It is driven by toggles that multiply leverage 3 to 1.
3. With maximum leverage at the top of the swing jaw, large rocks are crushed with less power.
4. The single light weight flywheel is easily started with a normal duty squirrel cage motor.
5. Kue-Ken precision machined toggle mechanism operates in a sealed, filtered oil bath to reduce wear and friction to the absolute minimum. Power that is wasted in non-sealed, dirt-catching mechanisms is fully utilized by Kue-Ken in crushing rock.

Kue-Ken also provides positive protection against damage by tramp iron. An automatic, adjustable safety release integral with the flywheel ends shearing or breaking parts. Production is resumed in minutes. In 33 sizes from 12" x 7" to 48" x 48", Kue-Ken Crusher crushes more rock with less power for lowest cost-per-ton crushing.

KUE-KEN® CRUSHERS

"CRUSHING without Rubbing"

STRAUB MFG. CO., INC. 8381 Baldwin St., Oakland 21, Calif.

Jaw Crushers Gyratory Crushers Overhead Eccentic Crushers Revolving Screens Classifiers Feeders Rib Cone Ball Mills Concentrating Tables Vibrating Screens

Pennsylvania Crusher Division, Exclusive Licensed Eastern Manufacturer and Distributor, 323 S. Matlack St., West Chester, Penn.
Armstrong Whitworth (Metal Industries) Ltd., Authorized Licensed Manufacturer and Distributor, Close Works, Gateshead-upon-Tyne 8, England

DEALERS:
SEATTLE, WASH., Washington Machinery Co. • VANCOUVER, B. C., Universal Equipment Co. • SALT LAKE CITY, UTAH, Lund Machinery Co. • SAN ANTONIO, TEX., Closner Equipment Co. • LOS ANGELES, CALIF., Garlinghouse, Freman Co. • SAN FRANCISCO, CALIF., Aggregate Engineers, Inc. • PORTLAND, OREGON, Air-Mac, Inc., of Oregon • BISMARCK, NORTH DAKOTA, Midwest Equipment Co.

engine power

BY CATERPILLAR

Here's a new profitable combination

Caterpillar-powered Gardner-Denver "Rota-Screw" portable air compressors reduce maintenance to lowest costs ever

Here is a major breakthrough in performance which means new low costs to users of compressed air. Gone are rotary blades or pistons. A helical "Rota-Screw" now eliminates blade chatter, vibration and whine. Quietness, pulsation-free air and minimum maintenance are the results.

Gardner-Denver's new SP900, a 900 CFM machine, is powered, as standard equipment, by the Cat D343 Diesel Engine. The SP600, a 600 CFM machine, is standard with the Cat D333 Diesel Engine. You get four-cycle design with full-stroke efficiency, plus full-length, watercooled cylinder liners for efficient cooling. Aluminum alloy pistons give low reciprocating weight, valve rotators distribute valve face wear and low-friction aluminum alloy bearings are known for superior strength and load carrying ability.

You'll like the Cat-powered Gardner-Denver line for the Caterpillar fuel system that provides "constant power" with *no* adjustments. Low-cost, high BTU fuels, such as household furnace oil, can be used instead of premium-cost No. 1 diesel fuel. Single orifice injectors and precombustion chamber design prevent fouling, even during long periods of idling between air demands. Electric glow plugs and ether starting arrangement are standard for quick, sure starts at below zero temperatures. Compressors are tested for a temperature range of −40° F. to 115° F.

Compressor service is available through a world-wide network of Gardner-Denver service points. In the U. S. alone there are over 5100 Caterpillar Dealer field service trucks on 24-hour-a-day call for engine service.

For more information on this new concept in compressors, write to the Gardner-Denver Company, Quincy, Illinois. Your nearby Caterpillar Dealer can tell you more about Cat Diesel and Natural Gas Engine Power for every application requiring from 50 to 950 HP, or write to Department 516, Engine Division, Caterpillar Tractor Co.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Engine Division, Caterpillar Tractor Co., Peoria, Ill., U. S. A.

Owen Bucket Company. Mr. Botten has been with the company 15 years in various production and sales capacities.

WILLIAM F. MARSTELLER JR. has been appointed secretary of the company. Mr. Marsteller will also be manager of the export department and will continue as advertising manager.

The appointment of ROBERT L. BAKER JR. as sales executive in charge of the Cleveland sales office of Bemis Bro. Bag Company has been anounced. Mr. Baker, a Bemis sales executive, cement accounts, in Peoria, Ill., since 1956, joined the company nearly 25 years ago as a laboratory assistant.

Two new branch offices have been established by The Okonite Company, wire and cable manufacturing subsidiary of Kennecott Copper Corporation, one in Denver, Colorado, the other in Charleston, West Virginia.

JAMES F. ANGLE, Rocky Mountain district manager, will be in charge of the new Denver office, and will continue to supervise activities at Okonite's Salt Lake City office.

JOHN P. OBLINGER, who formerly served the West Virginia area from Bluefield, Va., is now located at Charleston, W. Va.

WILLIAM S. GASKILL has been appointed general sales manager of Stanco Mfgs. & Sales, Inc., Santa Monica, Calif., construction and industrial machinery manufacturing and distributing firm.

JAMES A. PHILLIPS has been elected vice-president of Wellman International, Inc., New York, N. Y. Mr. Phillips had been with The Wellman Engineering Company in charge of sales for its Williams Bucket Division since 1951, and prior to that time, was with U. S. Steel Corporation.

Wellman International, Inc., is a subsidiary of the McDowell-Wellman Companies, engineers, contractors and manufacturers, with headquarters in Cleveland, Ohio.

DOUGLAS M. SMITH has been appointed marketing manager of the mechanical goods division of United States Rubber Co., New York, N.Y., it has been announced. Mr. Smith formerly was eastern regional sales manager of the division.

ELWOOD N. MOON has been named general sales manager for Clayton Manufacturing Company, El Monte, Calif. He assumes sales administrative responsibility for Clayton's Steam Generator, Steam Cleaner, and Dynamometer Division.

J. A. CORTRIGHT is retiring from administrative duties, but will continue to manage special promotions, and will continue vice-president in charge of sales. Mr. Cortright joined Clayton in 1935 as a district sales manager, assuming the post of general sales manager in 1945.

Mr. Moon joined Clayton in 1944, and since 1953 has served as assistant to Mr. Cortright in formulation and administration of all sales policies.

Three executive promotions have been announced at Bailey Meter Company, Cleveland Ohio.

H. H. GORRIE has been elected executive vice-president. Mr. Gorrie joined Bailey as a cadet engineer following graduation in 1927 from Rensselaer Polytechnic Institute. He was elected a vice-president in 1955, and a director in 1957.

L. F. RICHARDSON has been named vice-president in charge of sales activities and a member of the board of directors. He joined the company in 1930 as a cadet engineer after graduation from Iowa State University. Most recently he was sales manager of district operations.

J. H. DENNIS has been appointed vice-president in charge of all man-

no more downtime to replace connectors...

HANCO FLUX POWER SCREEN HEATERS

transmit power through the air!

With the all new Flux Power by Hanco all mechanical connections between transformer and screen are eliminated. The 0 to 4000 ampere current is transmitted through the air by inserting a conductor through the eye of the transformer. This permits unrestricted vibration, maximum power transmission and true screen balance.

★ Dust-tight, waterproof construction
★ Dual voltage, 220/440 volt
★ Use either plain or stainless cloth
★ Anti-magnetic steel side rails

write today for full details:

HANCO INTERNATIONAL

CANTON 7, OHIO, U. S. A. — CABLE HANCO

EUROPEAN SALES AND MFG.
HANCO INTERNATIONAL
6 WIBAUTSTRAAT • AMSTERDAM, HOLLAND

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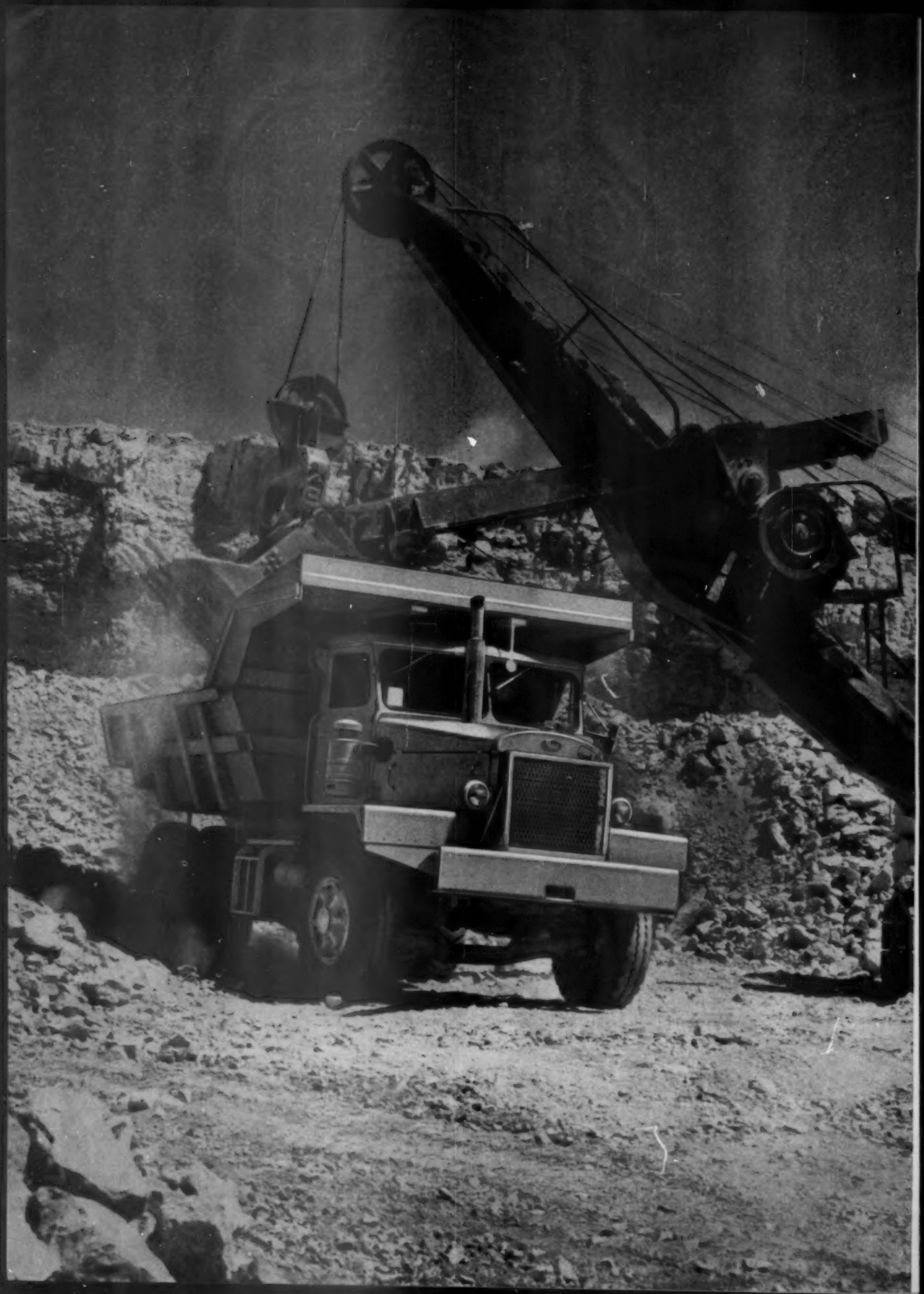


Initial link is hauling raw limestone to primary crusher. At Ideal Cement's Ada, Okla., plant, fleet of LVX Mack four-wheel dumpers keeps three shovels, including big six-yard dipper, hustling.

STRONG LINKS
in the cement-making chain

With seventeen manufacturing plants, **Ideal Cement Company** is a leading cement producer in the U. S. In the past two years, Ideal has opened new plants at Ada, Oklahoma, and Tijeras, New Mexico.

Each of these new plants is a continuous unbroken cement-making chain. Strong links in these chains are the Mack trucks used to carry limestone from quarry face to crusher. At Ada, for example, Mack LVX's keep pace with three shovels, providing a constant supply of raw material. At its Tijeras quarry, Ideal depends on LRX Macks.

Macks make these all-important links stronger because they are far less likely to fail prematurely . . . require far less maintenance attention . . . and operate at remarkably low cost per ton hauled.

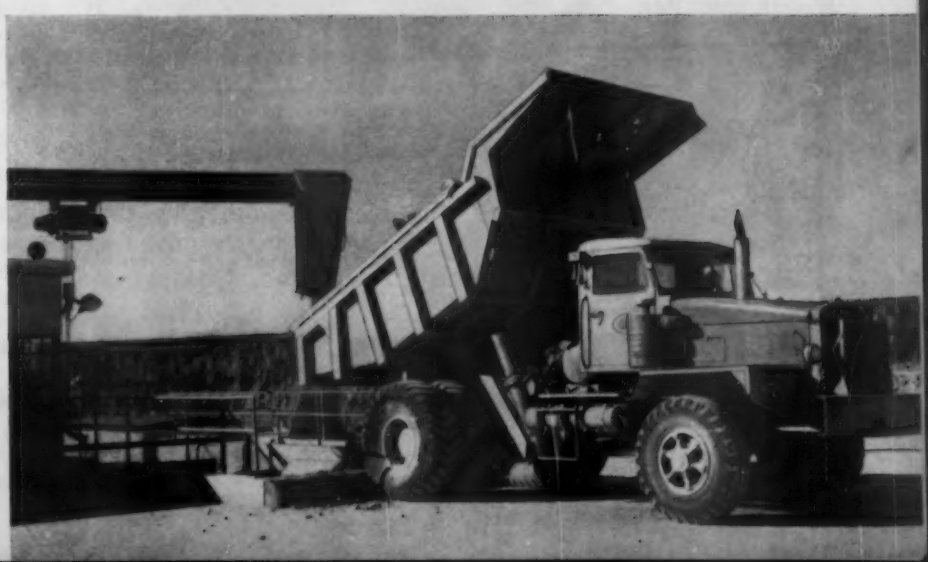
The reasons are easy to recognize. Mack components such as Mack-built transmissions . . . axles . . . frames . . . make up a vehicle that stands up and keeps coming back for more when pitted against truck-punishing jobs.

Make sure you have all the truck you can get under your shovels. Put a Mack to work. Mack four- and six-wheel off-highway dumpers from 15- to 45-tons capacity really put muscle into your quarrying operation. Mack Trucks, Inc., Plainfield, New Jersey. Mack Trucks of Canada, Ltd., Toronto, Ontario.

8201

MACK
FIRST NAME FOR
TRUCKS

Discharging its load into apron feeder, Mack LVX will soon be ready for return to shovel. Quick spotting at shovel and dump site attests to Macks' maneuverability, good driver vision.



Raw material of portland cement, limestone, is loaded into Mack LRX dumper at Ideal's new Tijeras, N. Mex., plant. Despite grueling pace, Macks require minimum time out for maintenance . . . return long, trouble-free life.

ufacturing activities and plants. Mr. Dennis also joined Bailey as a cadet engineer following graduation from Pennsylvania State University in 1937. He was named manager of manufacturing in 1960.

WILLIAM S. DOOLAN has been appointed district sales manager of the newly created south Atlantic district of the Bag Division of St. Regis Paper Company, New York, N. Y.

WILLIAM J. JENKINS has been named sales manager of Erie Strayer Company's Bucket Division, Erie, Pa. Mr. Jenkins replaces CHARLES POLINEK, who has resigned from Erie Strayer to become product manager of the Bucket Division, Blaw-Knox Corporation, Pittsburgh, Pa.

For the last three years, Mr. Jenkins has been crane attachment application specialist for Erie Strayer in the territory from Maine to Virginia.

The appointment of four additional dealers for The Eimco Corporation, Salt Lake City, Utah, has been announced.

Robert P. Stapp Machinery Company, with headquarters at Birmingham and branch offices throughout the state will handle sales and service in Alabama.

Lake Shore, Inc., of Iron Mountain, Mich., and Duluth, Minn., will handle Eimco sales and service within these and surrounding areas.

H. C. Ormes Equipment Company of Minneapolis, Minn., and Andrews Machinery Company of Seattle, Washington have likewise been appointed to handle the complete Eimco line.

R. S. WICK has been named product service manager for two-way radio equipment for the communication products department of General Electric. Mr. Wick was previously with G-E's military product service organization. He succeeds H. N. MCNEILL.

WILLIAM TORBICK, previously district manager at Syracuse, N. Y., has been appointed regional manager for mobile communications at Columbus, Ohio. He succeeds J. D. HELM.

Mr. McNeill and Mr. Helm have joined the company's computer department at Phoenix, Ariz.

The following men have been appointed district sales managers for two-way radio equipment: RAY C. LINNERTZ, Syracuse; DONALD E. GILLICK, New Rochelle, N. Y.; and EUGENE MORRISON, Wellesley, Mass.

Brown-Fogle Equipment Co., Houston, Tex., has been appointed a distributor for southeastern Texas by the Koehring, C. S. Johnson, Parsons, and Buffalo-Springfield divisions of Koehring Company.

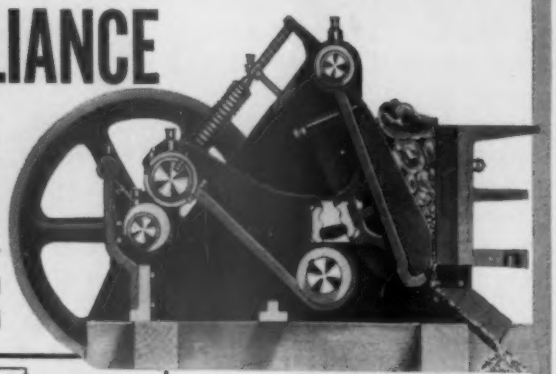
STUART TYLER has been appointed district representative for the Williams Bucket Division of The Wellman Engineering Company, Cleveland, Ohio, to cover western New York and Pennsylvania, Ohio, and West Virginia. Mr. Tyler was associated with Wepco Equipment Company, Cleveland, before joining The Wellman Engineering Company.

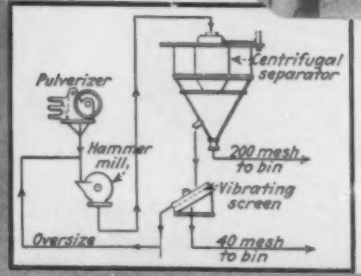
PERCY TODD has been appointed general sales manager of Industrial Boiler Company, Inc., Chattanooga, Tenn. For the last twenty years he has been employed in an executive capacity, primarily in sales, at the Simplicity System Company, one of the leading asphalt plant manufacturers.

NORMAN LEEDS JR., of Bridgeport, Conn., assistant general manager of the Raybestos Division of Raybestos-Manhattan, Inc., Stratford, Conn., died suddenly on March 12 at the age of 59. Mr. Leeds started with the Raybestos Division in 1926 and since 1956 has served as assistant general manager. He was elected to the Board of Directors of Raybestos-Manhattan, Inc., in 1955.

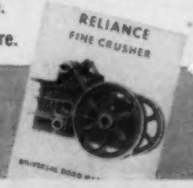
LEVER-TYPE PULVERIZER
by RELIANCE

CRUSHES HARDEST MATERIALS
¼" to dust in one operation





Successfully reduces limestone, emery rock, sand stone, granite, shale, iron ore, many others. No pre-breaking needed.
Ideal for first-stage preparation of material to be passed to a grinding mill and separator . . . see drawing.
Heavy-duty all-steel construction. Very low maintenance cost. Backed by 50 years experience.
Send for literature.



UNIVERSAL ROAD MACHINERY CO.
Main office and factory: Kingston, N. Y.
New York City office: 117 Liberty St.

Enter 168 on card, page 177

Enter 169 on card, page 177 →

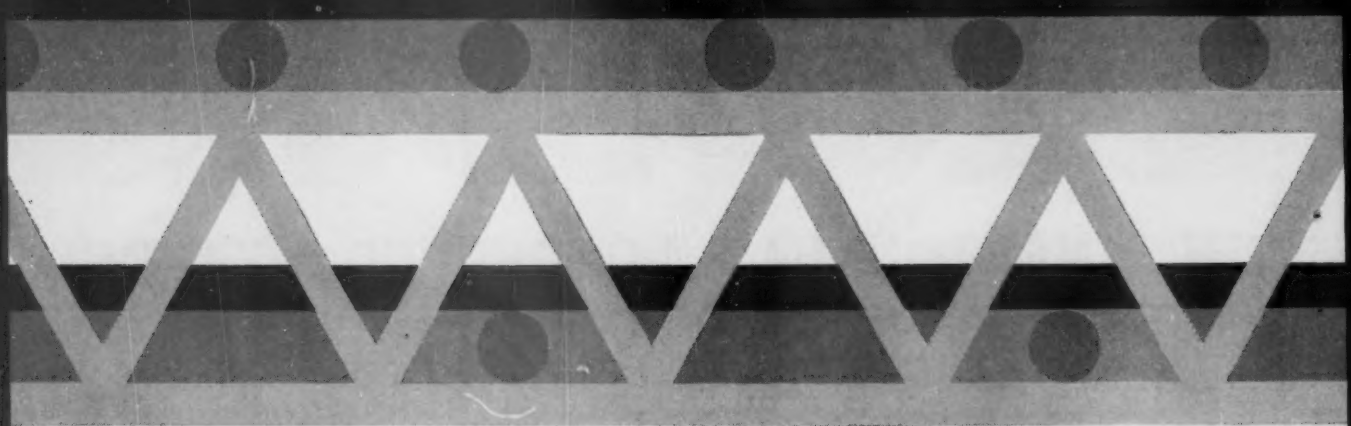
THIS MARION HAS LOADED 500 YARDS OF LIMESTONE AN HOUR....

When it needed to. And, that's the point. Even though the average production in this southwestern quarry is set at a somewhat more moderate pace, it's significant to note this Marion 112-M electric shovel, with a 4½ yard dipper, has the ability to produce at peak efficiency when called upon to do so. In that respect it is similar to all the machines in Marion's continually growing line of excavators. It's a point to remember when you consider the purchase of your next loader.

MARION POWER SHOVEL COMPANY • MARION, OHIO

A Division of Universal Marion Corporation

KEEP JOBS MOVING WITH THERMOID BIG T CONVEYOR BELTS



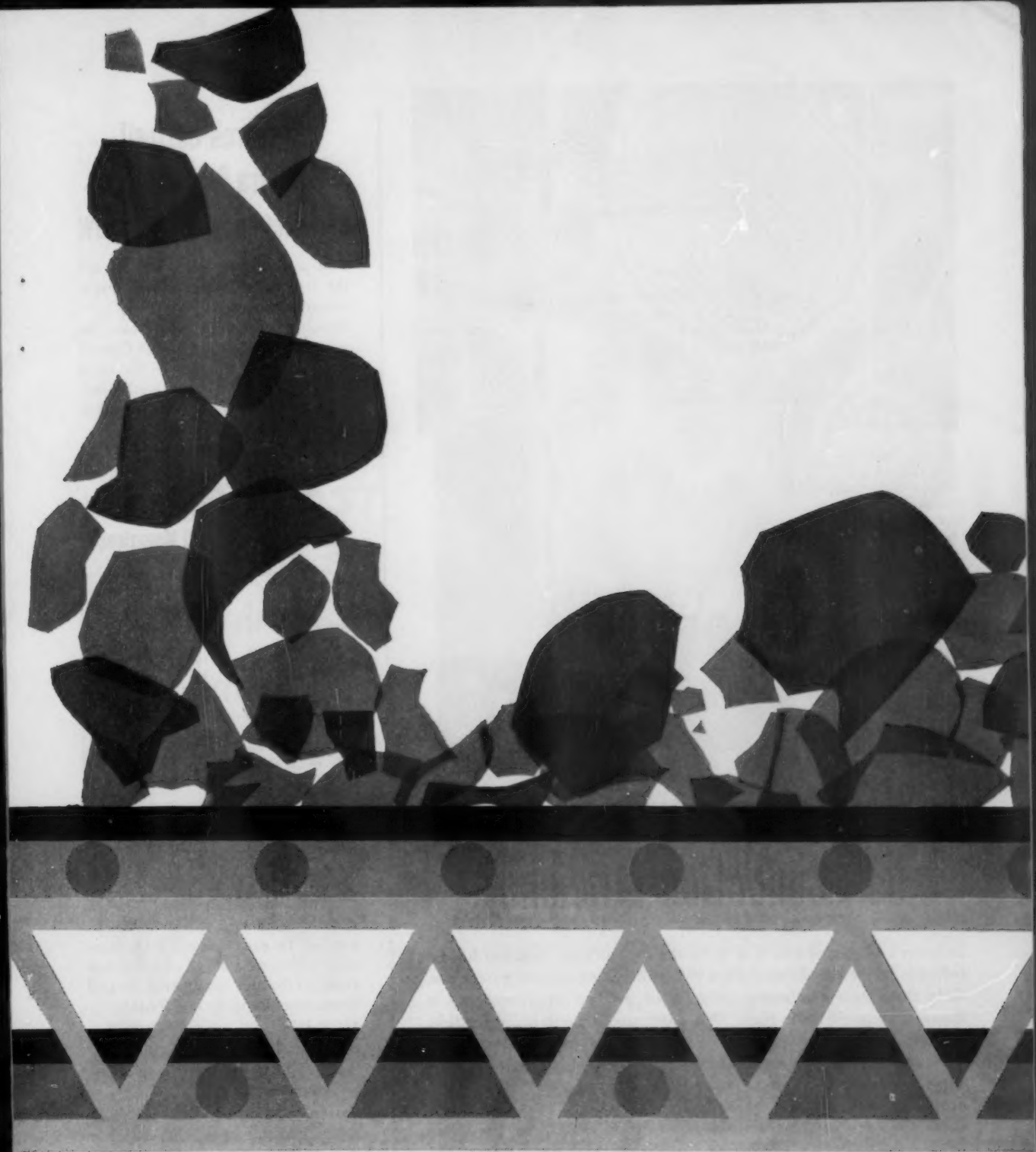
HIGH ABRASION-HIGH IMPACT THERMOID VICTOR BELTING OUTLASTS THEM ALL!

Dolomite, trap rock, flint and other heavy, abrasive materials fail to knock Thermoid VICTOR Belting out of service until long after less rugged belting would have to be scrapped. Thermoid VICTOR Belting stays on the job . . . gets it done with less down-time. A tough, natural rubber cover over nylon breaker strip keeps the belting coming back for more.

Write for complete details today. Then ask your Thermoid Big T distributor to prove how you can cut your haulage costs with Thermoid VICTOR Belting. He also stocks other Thermoid belting of all grades to fit every job requirement.

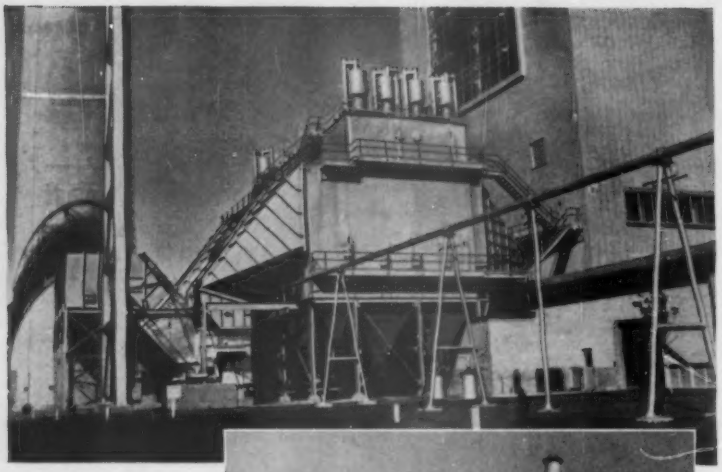
Quaker Thermoid

Enter 170 on card, page 177



THERMOID DIVISION PORTER H. K. PORTER COMPANY, INC.

200 WHITEHEAD ROAD, TRENTON 6, NEW JERSEY



Research-Cottrell precipitator at a 150,000 KW generating station cleans over half a million cubic feet of gas per minute with 99% collection efficiency.

Con Edison's 350,000 KW generating station at Arthur Kill, Staten Island, has Research-Cottrell precipitators guaranteed to collect 99% of the fly ash from 1,400,000 cubic feet per minute of combustion gases.

Why These Plants Specify 99% Collection Efficiency

Industry's concerted efforts to solve the *air pollution* problem has resulted in an increased demand for 99% collection efficiency guarantees. Only through a continuing program of product improvement has Research-Cottrell made these 99% guarantees economically feasible. Efficient voltage application; specific control of electrical sections; opzel collecting plates; automatically controlled, fully adjustable electrode rapping for optimum operation; accurate internal baffling; proper gas flow patterns through three-dimensional model studies—these are a few of the reasons why Research-Cottrell has been able to increase collection efficiencies without increasing the size of the precipitator.

Research-Cottrell Extra Premium Experience and Know-How

Past performance and reliability are the two major barometers of experience and know-how.

These are the factors which have inspired confidence in Research-Cottrell products as exemplified in the most recent independent central station surveys made by Power and Electrical World magazines.

1960 SURVEYS of Typical Power Stations by both POWER and ELECTRICAL WORLD Magazines

	Research-Cottrell Equipment	
	Power	Electrical World
Percentage of Total Installations In Survey	36%	39%
Percentage of Total Precipitators In Survey	39%	35%
Percentage of Total Gas Cleaning Capacity In Survey	45%	42%

These surveys covered 47 modern central stations including over 75 electrostatic precipitators for air pollution control. In each survey, there were more Research-Cottrell installations reported than for any other of the half dozen manufacturers in the field.

Make sure you receive the "extra premium" which goes with every Research-Cottrell product—experience and know-how.

Research-Cottrell Personnel are capable of handling any problem in the field of gas cleaning and will gladly assist you with your application.

For more information on Research-Cottrell's program of product improvement, contact our local representative or write to the home office.

Research-Cottrell

RESEARCH-COTTRELL, INC. Main Office and Plant: Bound Brook, New Jersey

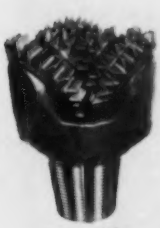
Representatives in principal cities of U. S. and Canada.

RC225

HUGHES *ROTA-BLAST* Bits are engineered for mining

Type **HH**
ROTA-BLAST
Formerly type RG-2JS
for extremely hard
abrasive rock
(Taconite, quartzite)

Type **H**
ROTA-BLAST
Formerly type W7R
for hard rock
(Siliceous limestone,
dolomite, sandstone,
granite)



Type **M**
ROTA-BLAST
Formerly type OW
for medium rock
(Limestone, sandstone,
sandy shales)

Type **S**
ROTA-BLAST
Formerly type OSC-1G
for soft formations
(Calcite, shale, clay)

Faster blast-hole drilling means more production, lower costs. In areas where blast hole drilling is the toughest, Hughes "Rota-Blast" rock bits and rotary drilling techniques, developed in close co-operation with operators and drill manufacturers, are increasing footage and penetration rate as much as 100% and more.

Your Hughes representative can recommend the "Rota-Blast" bit best suited to your operation, and is also qualified to offer you assistance in your drilling program. Back of his recommendations are more than a half-century of specialized rotary rock bit experience, and the world's largest rock bit manufacturing plant.

HUGHES
industrial products
HUGHES TOOL COMPANY • HOUSTON, TEXAS

Enter 173 on card, page 177

LEAVE WATER IN THE PIT...

HENDRIX DRAGLINE BUCKETS

bring profits up!

Even in wet digging Hendrix Dragline Buckets produce MAXIMUM loads for GREATER PROFITS! The scientifically-arranged perforations let water go through . . . leaving more material *inside!*

"A Type for Every Digging Purpose"...
¼ to 40 Cubic Yards-Perforated or Solid

Hendrix Lightweight Dragline Buckets

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

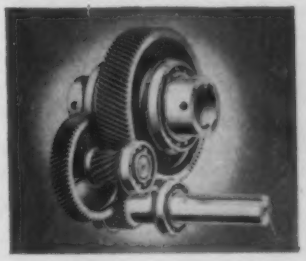
... the quality-engineered package

that simplifies speed reduction

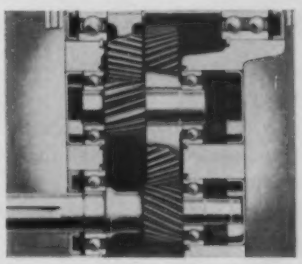
DODGE TORQUE-ARM, America's most widely used shaft mounted speed reducer, will save money for *you.* No foundation, no sliding motor base, no flexible coupling, no installation fuss. Developed and perfected by Dodge, this reducer has been so widely accepted in industry that it is now built and stocked in this unmatched range of sizes and models: capacities up to 170 hp; output speeds from 10 to 400 rpm; ratios of 5:1, 15:1, 25:1; speed ratios up to 175 to 1 with correct selection of speed reducer and V-belt drive. Built-in backstop available. Also positive overload release. Vertical models. Flange mounted models. Special application models ... Go modern—go Torque-Arm! See your Dodge Distributor, or write us.

Dodge Manufacturing Corporation, 4000 Union St., Mishawaka, Ind.

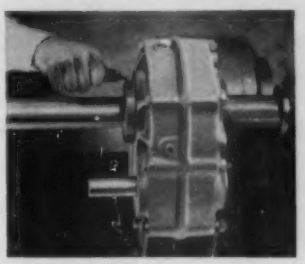
Rugged, semisteel housing holds bearing seats in line for entire life of unit. Laughs at loads. Corrosion resistant.



AGMA rated helical gears. Soft cores withstand shock; hardened surfaces defy wear. Teeth are crown shaved.



Gears are located *between* bearings and carry their loads without strain. Longer life, higher efficiency.



Unit slides completely onto shaft and locks on *both* sides of housing. This baby stays *put*—runs truer longer.

The Products with the Pluses... **DODGE** *of Mishawaka, Ind.*

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Look under "Dodge Transmissioneer" in the *white* pages of your phone book. Factory trained by Dodge, he can give you valuable assistance.

How Union-Camp's 5-Star Plan saved multiwall user up to $450 per carload of bags

This is a new kind of "Big-Inch" story.

A major mid-west packer* wasn't convinced his multiwall bagging operation was all it might be. Could Union-Camp's 5-Star Multiwall Plan help?

To get the answer, Union-Camp multiwall specialists visited the plant. They found that the automatically filled bags occasionally stuck in the sewing head. Also, that the sewing line tended to "belly" and form an arc pattern. The result was considerable loss in production and frequent breakage. Another problem—the bags didn't warehouse well.

"Sew-Straight" Solution

After completing their analysis, the Union-Camp men suggested installing a "Sew-Straight" attachment right onto the sewing head. The bags could now be closed with an "E" head in a perfectly straight line. And only *1 inch* from the top of the bag. That single inch made all the difference.

Less paper—less breakage

To begin with, shorter bags could be used. The savings in paper alone cut the firm's multiwall costs from between $350 to $450 a carload. Imagine the savings based on several dozen carloads a year!

Before and After. Old, semi-circular closure pattern (left) and the new closure (arrow). Note the straight sewing line, and how close it is to the top of the bag.

The new attachment also speeded production by eliminating sewing head jam-ups. Moreover, since the top closure is now identical to the *factory-sewn* bottom closure, the bags form a perfect pillow shape—no awkward ears. This makes them easier to handle . . . easier to stack. And there's less breakage and fewer rejects.

How much could you save?

Perhaps an idea unearthed through Union-Camp's 5-Star Plan could save you money. The chances are excellent. For every day, multiwall users, large and small, are reducing their multiwall costs by capitalizing on this comprehensive packaging service. Their savings run from a few thousand dollars to over $100,000 a year.

Apart from bag construction, this economy program covers bag design, specifications control, packaging machinery, and a survey of your materials handling operation. And it costs you nothing—regardless of the brand of bags you now use.

FREE 16-PAGE BOOKLET

Write Dept. M-3 today for a free copy of Union-Camp's new 5-Star Plan booklet. It describes many case histories showing how packers like yourself have achieved greater efficiency and economy in their multiwall operation.

UNION-CAMP®
MULTIWALL BAGS
Union Bag-Camp Paper Corporation 233 Broadway N.Y. 7 N.Y.

* NAME ON REQUEST

more information, please

Use postcard to receive literature or details on new equipment and products reported in this issue.

"FORMULA FOR DUST COLLECTION," an illustrated folder available from *The National Filter Media Corporation*, presents the factors in selection of engineered fabrics and custom designed dust bags. Temperature limit; strength; resistance to acid, alkali, and flex and abrasion; dust release; flame resistance; and cost ratio to cotton are tabulated for 10 fabrics in addition to cotton. **(301)**

OKONEX, BUTYL-BASE HIGH VOLTAGE INSULATION, is described in a 48-page reference manual issued by *The Okonite Company*, subsidiary of Kennecott Copper Corporation. The material is said to be resistant to ozone, heat, and moisture. Data on current carrying capacities, dimensions, and the various designs available are provided to assist engineers in designing and specifying efficient electrical systems. **(302)**

LARGE CAPACITY HAMMERMILLS are set forth in a pamphlet released by *Gruendler Crusher & Pulverizer Co.* Specifications for a variety of models are given. Capacities, according to the material being handled, are listed. **(303)**

FLOLIFT BULK MATERIALS DUMP TANK trailers manufactured by *The Heil Co.* are set forth in a folder available from the company. Weight, unloading, cleaning, and convertibility of the units are discussed and gravity and pneumatic discharge explained. **(304)**

DUST COLLECTING, RECOVERY, AND CLASSIFYING equipment for air pollution, material handling and classification, recovery of material from waste gases, and the provision of employee comfort are described in a pamphlet from *Buell Engineering Company, Inc.* **(305)**

BUCKET-ELEVATOR SYSTEMS FOR BULK handling of stone, clay, rock, sand, gravel, lime, etc. are described in an 84-page manual, Catalog be-55, published by *Webster Manufacturing, Inc.* Specifications for a wide selection of basic bucket-elevator types—centrifugal discharge, perfect discharge, continuous bucket, gravity-discharge elevator conveyors, and pivoted-bucket carriers—are given. Eight factors for consideration in selection are listed, and practical examples to explain the use of this information in selecting specific bucket-elevator types are given. Tables list 101 different bulk materials regularly handled in industry, and 318 possible bucket-elevator types from which to select for a specific situation. **(306)**

A ROUNDUP OF NORDBERG machinery is contained in a 24-page booklet released by *Nordberg Mfg. Co.* Included are Symons gyratory and cone crushers, Symons vibrating grizzlies and screens, Gyradisc crushers, grinding mills, and similar equipment. **(307)**

A LIGHTWEIGHT AIR SAMPLER for sampling all types of particulate airborne material in such applications as cement mills is described in an illustrated specification sheet available from *Union Industrial Equipment Corporation.* Also available is a folder that describes the Unico cascade impactor for simplified particle size analysis. **(308)**

BIN-DICATOR HYPERBOLIC OUTLET for providing fast, free, and uniform flow of most difficult granular and lump materials is described in a folder available from *The Bin-Dicator Company.* The unit replaces the lower section of a conventional hopper and becomes an integral part of the bin. The design is based on the pressures normal to the outlet walls, and on discharge pressure. Capacities and specifications are included. **(309)**

JUNE ***PIT AND QUARRY*** ***1961***

Insert key numbers found below items on advertising, literature, and new equipment pages. Print company name if not keyed.

Void after 60 days.

_____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

We produce _____

FIRST CLASS
PERMIT NO. 44
CHICAGO, ILL.

BUSINESS REPLY CARD

No Postage Stamp Necessary if Mailed in the United States

—POSTAGE WILL BE PAID BY—

Pit and Quarry Publications
431 South Dearborn Street
CHICAGO 5, ILL., U.S.A.

more information, please

Use postcard to receive literature or details on new equipment and products reported in this issue.

CABINET DIAL AND PILLAR DIAL indicators are set forth in a pamphlet published by *Fairbanks, Morse & Co.* Features common to both types of dials are swivel head, easy-to-read chart, and open-face, center-indicating tare. Cutaway photos show the patented "Floaxial" mechanism. **(310)**

DIESEL ENGINES IN SHOVEL AND DRAGLINE applications are covered in Bulletin #125, issued by the White Diesel Engine Division of *The White Motor Company.* Construction features including recent design improvements, supercharging, and operation of nonpremium fuels, amplified by cutaway drawings and photographs, are explained. Engineering data on dimensions, condensed specifications, and performance and fuel consumption charts are also supplied. **(311)**

CAUSES OF SCALE ERROR and the steps required to eliminate it are outlined in an 8-page booklet issued by *The Howe Scale Company.* **(312)**

"VIBRATION, EXCAVATION, OR SOUND PROBLEMS?", introduces the seismographic services offered by *Vibra-Tech Engineers Inc.* Such services as the solution of excavations problems by subsurface surveys, preblast surveys, and blast noise analysis are described. **(313)**

PIPE AND TUBING MEASUREMENT is explained in a Bulletin #631 from *Aeroquip Corporation.* Standard methods of measurements for various fittings and fluid-carrying lines, and standard practices for measuring adapters and complete assemblies are given. The dash numbering systems commonly used in pipe and tubing measurements are also explained in chart form. **(314)**

"BUCKET WHEEL LOADER FOR FEEDING CONVEYORS AND LORRIES," is an illustrated folder that contains a description of the wheel developed by *Weserhutte Otto Wolff G.M.B.H.* in Germany. The unit reportedly replaces conventional loading equipment that cannot keep pace with the output of conveyors for loading such material as gravel, sulphur, etc. All models can be supplied with U.S.-made engines. The folder is available from *Combined Agencies Corporation.* **(315)**

GOOD BELT CONVEYOR PRACTICE FOR MINING is the subject of a booklet offered by *Hewitt-Robins.* The booklet is a reprint of material covered by N.E.M.A. Standards for Mining Belt Conveyors, MB 1-1956. **(316)**

MULTIPLE UNIT VALVES FOR USE ON HYDRAULICALLY operated mobile equipment are described in Bulletin M-5112, released by *Vickers Incorporated,* division of Sperry Rand Corporation. The valves, Series CM11, are available in any number of sections up to 10, with individual load checks in each section, and are rated for operation to 2,500 p.s.i. **(317)**

A PIVOTING PYROMOTER SYSTEM that detects impending hot spots on the shell of a rotary kiln or other high temperature vessel is the subject of a 4-page data sheet available from *Leeds & Northrup.* The publication describes the advantages of automatic hot-spot detection, and explains how the Rayoscan system is applied for continuous and reliable monitoring of kiln-shell temperatures. **(318)**

Material listed here is FREE unless otherwise noted.

FIRST CLASS
PERMIT NO. 44
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NEW SUBSCRIPTION ORDER FORM

Send PIT AND QUARRY to me for

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City _____ Zone _____ State _____

Type of business and products _____

*U. S., U. S. Possessions, and Canada only.

Pan American countries, $10 a year; elsewhere, $15 a year.

Two ML-157 Moto-Loaders work in the Giordano Brothers gravel pit in Whitevale, Ontario, Canada.

ONE MOTO-LOADER FOLLOWS ANOTHER

These two ML-157 Moto-Loaders, equipped with 2-yd. buckets, work 12 hours a day loading bank run gravel into trucks to haul to the gravel plant and then loading out gravel from stockpiles. They have been doing this for two years—ever since the first one proved its performance in this pit on a demonstration. It did such a good job compared to competitive machines, they just wouldn't let it go. The second one was added shortly after.

A demonstration will convince you too, of how much more an ML-157 can do—how its job-tested features can put more profit in your pocket with its power, stamina, balance and fast, easy control. The bucket fills easily, fully. Planetary wheel drive keeps torque near the ground where it belongs. Low center of gravity and proper weight distribution eliminate teeter and bounce. Power-shift transmission, plus one-foot control of forward, reverse and acceleration, give cycle times that up production.

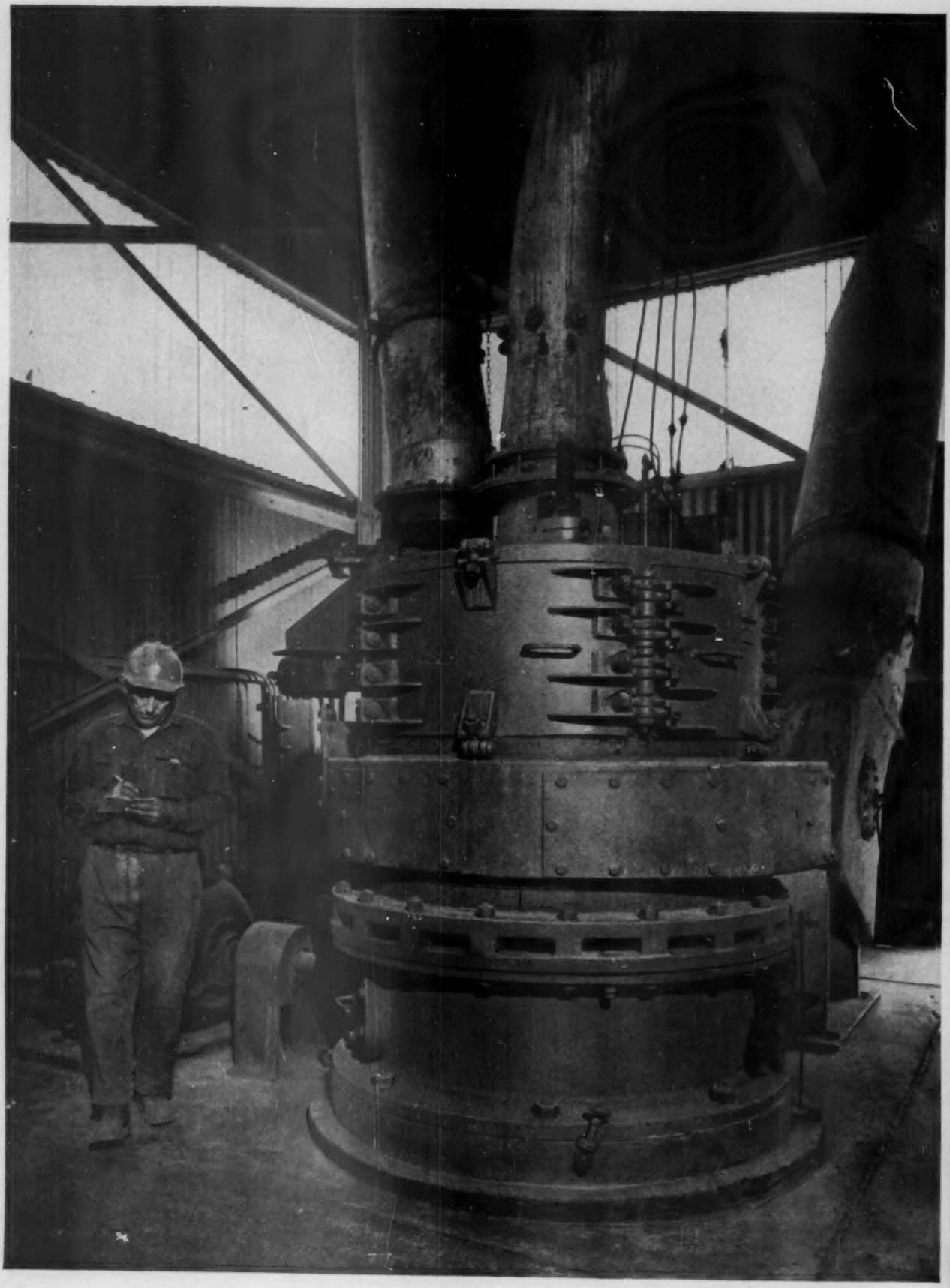
There are many more reasons why the Lorain ML-157 merits your investigation. Why not let your nearby Lorain distributor tell you the full story. Call him today.

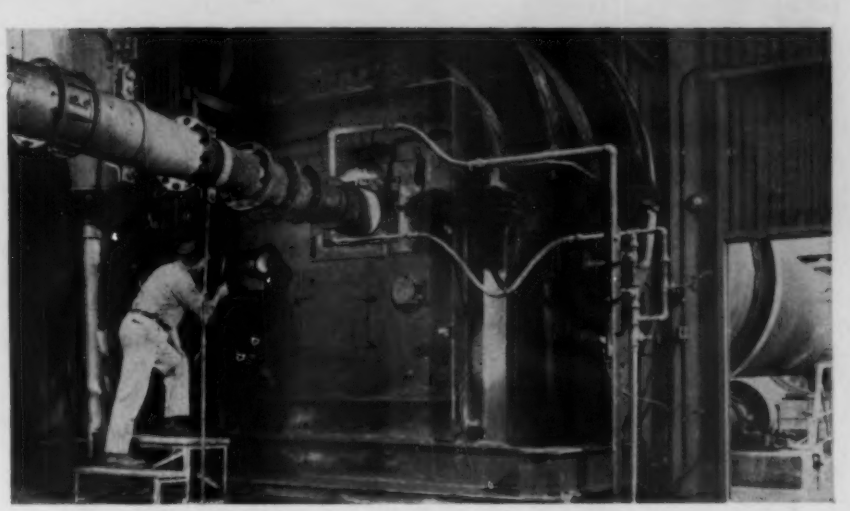
THE THEW SHOVEL COMPANY, LORAIN, OHIO

LORAIN®

DOES MORE FASTER • FOR LESS

PLANTS in Lorain and Elyria, Ohio.
PRODUCTS—Power shovels, cranes, draglines, clamshells, and hoes on crawlers from ⅜- to 2½-yard capacity • Cranes from 7 to 80 tons . . . on crawlers, and as rubber tire Moto-Cranes, and Self-Propelled Cranes • Rubber tire front-end Moto-Loaders in 6,000-lb., 7,000-lb., and 9,000-lb. operating capacities.
OUTLETS—Lorain products sold and serviced by 249 distributor outlets throughout the world.





Fifty-fifty mixture of high moisture content anthracite and bituminous coal is easily ground and dried by B&W EL-35 pulverizer shown at left.

Full capacity is assured by uniform fineness and efficient firing of coal mixture to 10½ by 150-foot cement kiln (right).

Hard Coal and Soft...

This B&W dual-fuel pulverizer grinds both at the same time, with maximum availability and continuous service

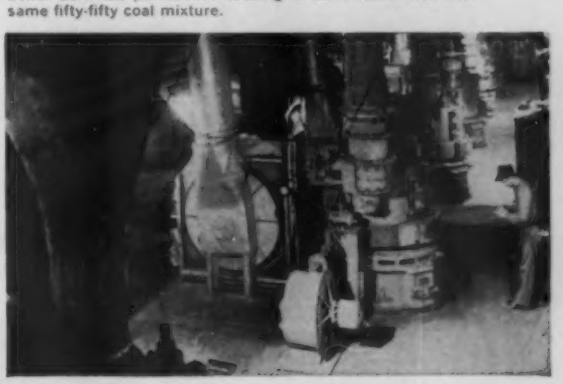
This B&W EL 35 pulverizer, in its 4 years of operation at the Whitehall Cement Manufacturing Company, Cementon, Pennsylvania, has given maximum availability and continuous service grinding a fifty-fifty mixture of anthracite and bituminous coal, with respective moisture contents of 12% and 6%. B&W pulverizers deliver, dry and preheated, any grade of coal with moisture content as high as 20%. Uniform fineness and full capacity are maintained with this coal mixture direct fired into a kiln producing 2,800 barrels per day.

Operating and maintenance costs are low. Grinding elements maintain full contact for maximum production throughout their long lifetime. High quality clinker production is assured with a fully automatic control system which accurately maintains optimum kiln combustion conditions. The efficiency of this direct firing system has contributed to the exceptionally low coal rate of only 44.5 lb/bbl (585,000 Btu/bbl).

With soundly engineered products such as this, B&W develops more efficient fuel firing equipment for industry throughout the world. For additional information on B&W direct firing systems for rotary kilns, write for Bulletin C12. The Babcock & Wilcox Company, Boiler Division, Barberton, Ohio.

Efficient, automatic control is fully maintained from centrally located instrument console equipped with Bailey Meters.

Top performance direct-firing is obtained from six additional B&W EL pulverizers feeding smaller kilns with the same fifty-fifty coal mixture.



B&W

C-221

THE BABCOCK & WILCOX COMPANY • BOILER DIVISION

This mark tells you a product is made of modern, dependable Steel.

Tiger on the Spot at Michigan Limestone

USS Tiger Brand hoist rope lasts 8 months digging rock

Eight months on the rock pile is a long time for any hoist rope to survive . . . but that's the average service life of USS Tiger Brand 6x41 hoist ropes on this big shovel. The rope is 2 inches in diameter and is made from tough monitor steel. Lang Lay construction gives longer wearing qualities and the wire rope core adds extra strength.

All the ropes on this shovel have the same construction. The 1⅝" counterweight ropes last about six months. The 2⅛" boom suspension ropes show no signs of fatigue and the boom hoist ropes are in excellent condition after years of service.

Tiger on the Spot. At Michigan Limestone, the Tiger Brand Field Service Representative is really on the spot. Many different types and makes of digging equipment are in use . . . and each requires different wire rope constructions. It takes an experienced man to recommend the best rope for each application. This is an important *plus* service you get when you use USS Tiger Brand Wire Rope.

Another big advantage is the wide selection of constructions available in Tiger Brand Rope. You can get the *right* ropes for your particular machines—ones that will last longer and produce more with less downtime for re-rigging.

FREE CHECK UP! Why not put the Tiger on the spot? Call in our field service representative. Have him check your machines for proper rope application. He can probably save you money. This service is available through your local Tiger Brand distributor, or write direct to American Steel and Wire, Dept. 1189, 614 Superior Ave., N.W., Cleveland 13, Ohio. USS and Tiger Brand are registered trademarks

14,400 tons per 8-hour shift—that's the average work load for these USS Tiger Brand Hoist Ropes that last for 8 months in this rugged service.

Strength, flexibility and long life are built into these Tiger Brand 6x41 Excellay Monitor Lang Lay IWRC Hoist Ropes. **All ropes**—hoist, counterweight, boom suspension and boom-hoist are USS Tiger Brand.

American Steel and Wire Division of United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
Tennessee Coal & Iron Division, Fairfield, Alabama, Southern Distributors
United States Steel Export Company, Distributors Abroad

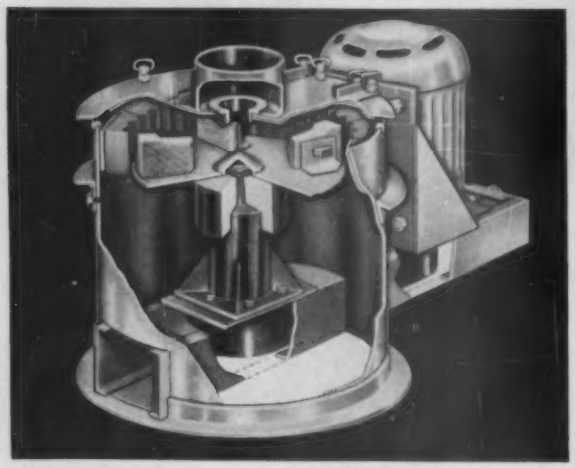
HAVE YOU CHECKED THE NEW, BETTER WAY TO CRUSH?

enthusiastic users say the

TORNADO

SQUARE IMPACT CRUSHER

turns out a dense graded cubical product—yet it is the most versatile crusher ever put on the market. Produces any range of crushing, to screen



to any gradation required, in an almost unbelievable number of tons per hour, and does it at less cost than Rod Mills or other types of Crushers priced up to TEN TIMES AS MUCH!

Virtually no "down time"—you can keep it in operation 22½ hours a day, 7 days a week, year after year.

Light in weight—requires no massive foundation and little head room. Power requirement amazingly low. No zincing or babbitting needed.

Write, wire, or phone collect for details. We'll run a sample of your own material through the Tornado to PROVE how much it will do for you.

WERCO Steel Company
2151 East 83rd Street, Chicago 17, Ill.
Phone ESsex 5-8446
Cable Address, IMPACTOR

Enter 184-A on card, page 177

BLAST HOLE PROBLEM:
U. S. BORAX, BORON, CALIFORNIA

BLAST DRILL MUST:

- produce 30-50′ deep 7⅞″ blast holes for overburden stripping
- produce 31′ deep 4¾″ holes in the ore body
- produce 100′ deep 4¾″ exploration holes
- produce a minimum of 1,000′ blast holes per shift
- be able to move swiftly from ore area in deep pit to overburden area at ground level.

SOLUTION: *PORTADRILL* diesel powered, Model 505B mounted on tandem axle truck. Unit includes 2-stage high pressure air system with cross-over to operate as two single stages (500 cfm @ 100 p.s.i. or 640 cfm @ 40 p.s.i.) 38′ mast; 33′x5″ dia. drilling bar (kelly); 33′x3½″ dia. drilling bar with travelling steady bearing; 20′ length of 5″ dia. drill steel and 4-20′ lengths of 3¼″ dia. drill steel; rack to carry drill steels and pipe handling and power break-out tools for both sizes.

RESULT: Drill unit performs ALL drilling requirements with 2-man crew. 31′ blast holes are drilled in 12 minutes. One man operates the drill unit while the second man remains in the truck cab, ready to move the drill as each hole is completed. Interchange of duties between the two men relieves fatigue and maintains two trained operators.

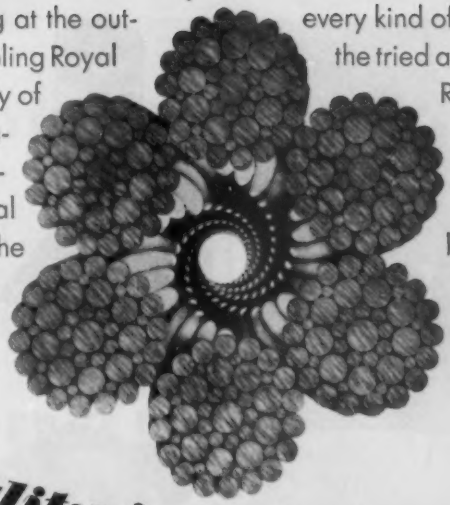
An outstanding PORTADRILL advantage is that each unit may be completely customized to meet YOUR blast hole requirements . . . 8 Portadrill models for 3½″ to 9″ dia. holes are available. Inquiries Welcome.

PORTADRILL
REG. U.S. PAT. OFF.

Mfg. by the Winter-Weiss Co.
2201 Blake St. Denver 5, Colorado, U.S.A.

Enter 184-B on card, page 177

Here are two ways of looking at the outside and *inside* quality of Roebling Royal Blue Wire Rope—the uniformity of wires and strands. Their symmetry would be relatively insignificant, however, without Royal Blue's *extra* high strength. It's the combination that is the source of real wire rope savings. For long, economical service on every kind of job, there is no substitute for the tried and proven quality of Roebling Royal Blue. It pays off for *you*. Learn more about Royal Blue from your wire rope distributor, or write now for free booklet to Roebling's Wire Rope Division, Trenton 2, N.J.



ROEBLING

Branch Offices in Principal Cities
John A. Roebling's Sons Division
The Colorado Fuel and Iron Corporation.

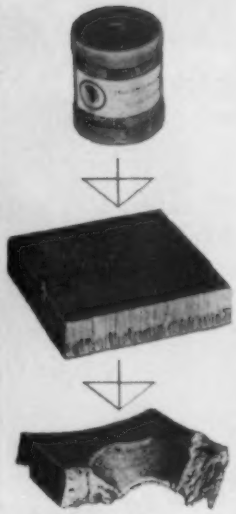
Quality inside and outside

We put a lot of work into it—
You get a lot of work out of it

Furnishes a positive seal for round flexible joints. Used by leading dredging and hydraulic sand-and-gravel operators, and the U. S. Engineering Corps. This Multi-use chain sleeve clamp is easy to apply . . . positive in action. Write for illustrated folder, today.

The Black Brothers Co., Inc., 501 9th Ave., Mendota, Ill.

Enter 186-A on card, page 177



Trojan Pentolite Primers

If you don't think there's a big difference in primers see for yourself what happened to a 6″ x 6″ x 1″ steel plate when a No. 4 (½ lb.) Trojan Primer was placed on it and detonated.

New Bulletin #101 upon request.

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TROJAN *Explosives*

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EXPLORATION FOR MINERAL DEPOSITS
INCLUDING URANIUM & LIMESTONE — ANYWHERE

FOUNDATION TEST BORING

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Skilled crews and complete stock of core drills and accessory equipment maintained at all times

Core Drill Contractors for more than 60 years

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Contract Core Drill Division
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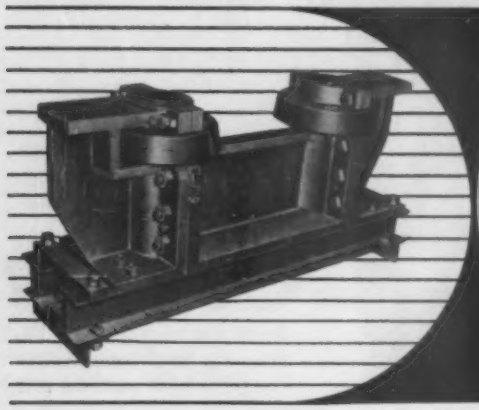
Announcing

TERRIFIC Used Equipment BARGAINS

See

PIT & QUARRY'S Broadcast Section Page 190



PROBLEM:
Excessive downtime for thrust roller maintenance

SOLUTION:
Bethlehem-designed heavy duty thrust idler assembly

Rugged, yet compact, effectively controlling what was once an unruly kiln. If you have a thrust roller problem, Bethlehem's IMPROVEMENT ENGINEERING followed up by manufacturing know-how can give you the efficient, economical solution.

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Crushes almost any ore . . .

. . . faster,
cheaper,
better!

Fe · Zn
Cu · W
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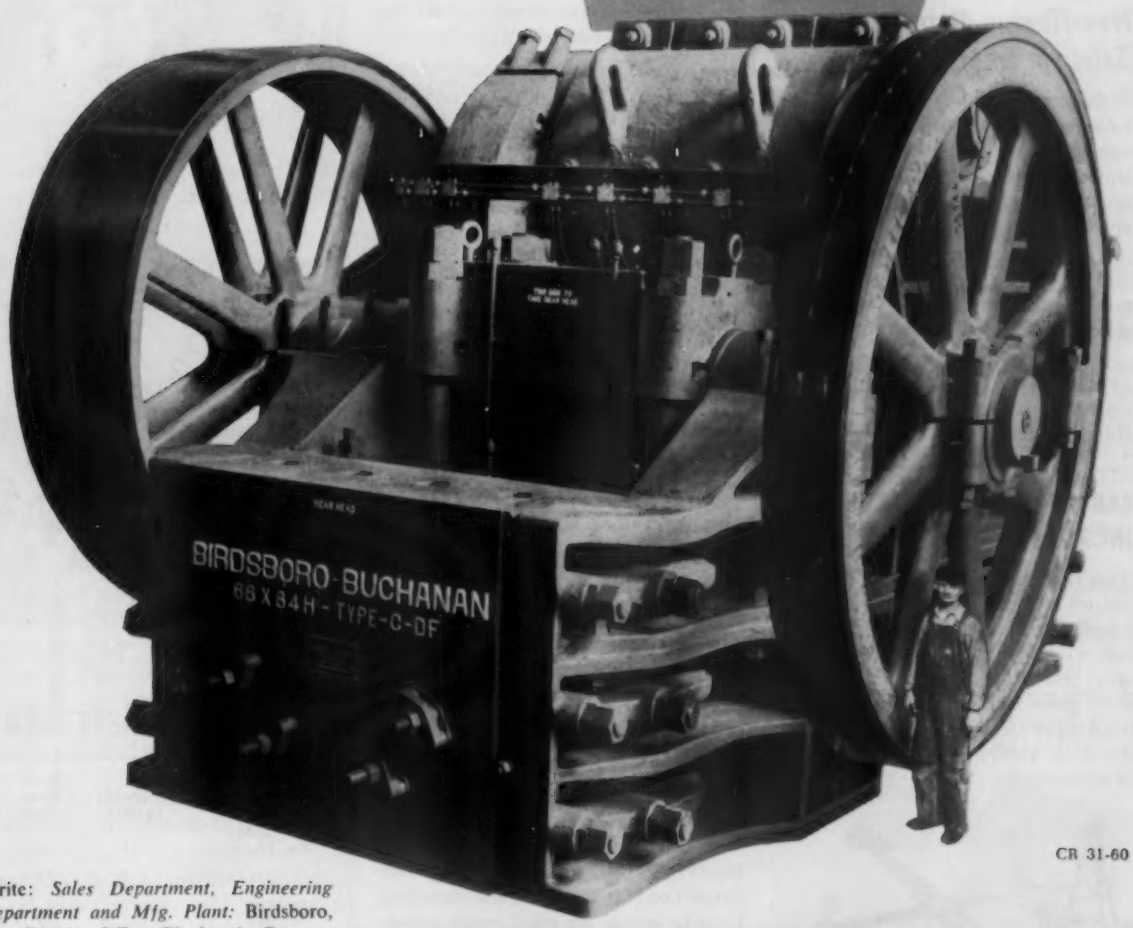
BIRDSBORO BUCHANAN
deep-frame Jaw Crushers



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Write: *Sales Department, Engineering Department and Mfg. Plant:* Birdsboro, Pa., *District Office:* Pittsburgh, Pa.

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These hopper trailers let you load and unload in record time, haul bigger payloads over the highways, schedule more trips per year.

Enclosed Gar Wood hoppers are available as train or semi-trailer units, equipped with one, two, or three discharge gates.

GAR WOOD HOPPER TRAIN INCREASES HAULING CAPACITY

This big, rugged double hopper train carries a total of 20.5 cubic yards. Ideally suited for general contracting use with aggregate, sand, fill, and spoil materials. Air-powered clamshell gates allow quick dumping at high speeds. Material can be pit-dumped, windrowed to specifications, or stockpiled.

TRAILERS CUSTOMIZED FROM STANDARD EQUIPMENT TO MEET EVERY RESTRICTION, EVERY APPLICATION

Though Gar Wood hopper trailers are available in a wide range of open and closed models for train and semi-trailer operation, with a complete line of discharge gates, they may also be customized to your exact road-weight restrictions, your exact application.

This design versatility allows you not only absolute maximum payloads, but faster, more efficient operation at minimum maintenance and operating costs. You get a unit specifically tailored to bring you the greatest possible revenue within your specific field of operation.

GAR WOOD "EASTERNER" hopper trailer gives you powerful tandem-drive traction plus far greater legal payloads. This unique combination produces extra hauling revenue for both on- and off-highway work.

New York Contractor Earns 45% More With "EASTERNER"

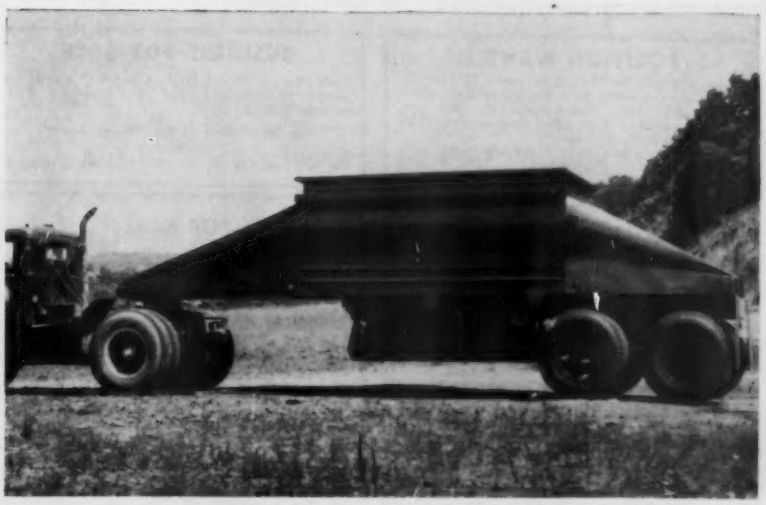
A recent on-the-job Payload Analysis in New York State compared the performance of a tandem rear dump truck and a Gar Wood "Easterner" hopper trailer, both owned by the same contractor. The job involved hauling gravel for road construction.

The figures shown were not drawn up in an office, they were compiled with the contractor in the field. The contractor is now replacing more of his rear dumps with Gar Wood "Easterners."

	HOPPER TRAILER	REAR DUMP TRUCK
Legal Yards Per Trip	15	10½
Yard-Miles Per Trip	105	73.5
Revenue Per Trip, Per Unit	$13.20	$9.11
Revenue Per Day	$158.40	$109.32
Working Days Per Year	120	
Extra Revenue Per Day	$49.08	
EXTRA REVENUE PER YEAR, PER UNIT	$5,889.60	

FREE PAYLOAD ANALYSIS HAUL MORE-EARN MORE!

New Service Can Help You Greatly Increase Your Hauling Income



GAR WOOD MONO-SHELL HOPPER TRAILERS are sold and serviced by the nation's largest network of experienced truck equipment specialists. These Gar Wood distributors know your local hauling problems, understand your state axle-weight laws.

WAYNE, MICHIGAN—Gar Wood Industries, world's pioneer truck equipment firm, announces an exclusive new service that determines, in dollars and cents, the amount of additional income you can earn with Gar Wood Mono-Shell hopper trailers, *and then helps you earn it!*

Gar Wood engineers first make a Free Payload Analysis of your operation. They calculate the hauling revenue for each of your present units by yard-mile, day, and year, and compare the data with the established nine-year performance record of Gar Wood hoppers. And then, regardless of your hauling job, Gar Wood will *show* you how to use hoppers to earn that extra income.

The results are often amazing. To date, Gar Wood has been able to offer haulers as much as *45% extra revenue per year* (see story opposite page) plus significant increases in operating efficiency.

Think what 45% more revenue, practically all pure profit, could mean on your own job. Then mail the coupon below.

HOPPERS ELIMINATE FINES, RAISE PAYLOADS, LET YOU OPERATE LEGALLY AT A PROFIT

Whatever your regional requirements, Gar Wood hoppers let you haul legal payloads not obtainable with any other equipment, and eliminate profit-slashing overload fines. The reasons: exclusive Mono-Shell construction that cuts dead weight to a minimum, and exclusive mounting techniques that distribute more weight over a much greater axle span.

Gar Wood has employed these methods in designing hoppers for on- and off-highway work, in hoppers for hauling all types of materials, in hoppers specifically tailored to axle-weight laws in every state in the country.

Start taking advantage of this opportunity to increase your profits now. Let Gar Wood show you how hoppers will give you a legal operation that is faster, more efficient, more productive—an operation that will let you make much more money.

SEND FOR YOUR FREE PAYLOAD ANALYSIS TODAY

Name _____

Address _____

City _____ State _____

☐ SEND FREE LITERATURE

☐ SEND FREE PAYLOAD ANALYSIS FOR THE FOLLOWING:

Type of material hauled _____

Present type of equipment _____

Tare weight of present equipment _____

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Miles per trip (one way) _____

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June 1961

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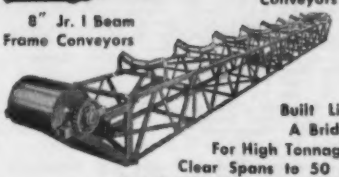


Built Like A Bridge For High Tonnages Clear Spans to 50 Ft. Any Length - Any Belt Width.

Complete Pre-Fab sections of 8" Jr. I-Beam Frame and 30" Deep Truss Frame. Manufactured for quick and easy assembly on the job site. Equipped with 5" diameter troughing idlers and return rolls, 20" diameter head pulley and 16" diameter tail pulley.
Price includes conveyor complete with 4-ply, 28 oz. duck MAJOR BRAND belt with 1/8" x 1/32" rubber covers.
Other lengths priced on request.

WRITE FOR BULLETINS No. 1138 and No. 1189

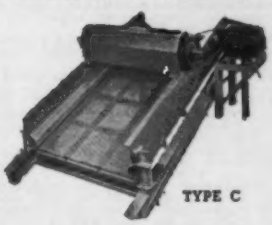
Belt Width	Conveyor Length	I-Beam Frame Price	Truss Frame Price
14"	25'	$ 706	$ 965
14"	50'	1181	1510
14"	85'	1763	2273
16"	20'	700	875
16"	45'	1128	1434
16"	60'	1384	1770
16"	90'	1897	2442
18"	25'	830	1104
18"	45'	1190	1573
18"	70'	1641	2159
18"	100'	2182	2862
18"	130'	2723	3565
20"	25'	871	1170
20"	60'	1546	2016
20"	75'	1836	2388
20"	90'	2125	2760
24"	25'	922	1200
24"	45'	1335	1723
24"	70'	1852	2377
24"	100'	2473	3160
24"	120'	2886	3683
30"	50'	1591	2018
30"	70'	2054	2594
30"	90'	2518	3170
30"	100'	2749	3458
36"	25'	1105	1393
36"	45'	1623	2024
36"	60'	2012	2497
36"	100'	3048	3758

NEW BONDED® HEAVY DUTY MOBILE CONVEYORS

- FAST ECONOMICAL HANDLING OF BULK MATERIAL
- AVAILABLE WITH SCREEN AND FEEDER
- RUGGED 30" DEEP TRUSS FRAME
- HIGH TONNAGE AT LOW COST
- EQUIPPED WITH TOW HITCH

The economical solution to the need for a heavy duty conveyor that can be readily moved from one job-site to another. Available with mast or mastless type undercarriage and hydraulic powered mechanism. All standard conveyor accessories can be used. Lengths to 60 feet and belt widths through 30 inches. **WRITE FOR CATALOGUE.**

NEW BONDED® SPECIAL SERVICE & HEAVY DUTY VIBRATING SCREENS



TYPE C

WRITE FOR BULLETIN #1224

For scalping middle-range pieces and accurate sizing of fines but where quantity and feed do not warrant a larger capacity, heavy duty model. Medium to heavy construction. Can also be suspended from four steel cables and springs for portable or temporary installation. Vibration remains in working screen body. No shaking of tipple, building or platform. **Priced from $487**

TYPE B

FACTORY BALANCED, CONTROLLED VIBRATION. Four bearing, positive throw eccentric shaft. 3' x 6' to 5' x 14'. 1 to 5 decks. **WRITE FOR BULLETIN No. 1087 and "9 REASONS WHY BONDED IS YOUR BEST BUY."**
For high tonnages, heavy scalping and multiple sizing of materials and industrial products. No dead spots. Springless live-rubber mounting of screen body controls vibration. Screen cloth and plate in all models reversible for longer life.
PRICED FROM .....$1620.

TESTED CONVEYOR BELTING

WE PAY FREIGHT ON 200 POUNDS OR OVER. QUANTITY DISCOUNTS ON 300' OR OVER UPON REQUEST

All belting is tested by the Engineering laboratory of one of the largest universities in the United States. It is guaranteed to meet or exceed listed specifications.

Other widths, plies, duck weights and cover thickness available at low prices.

WRITE FOR FREE SAMPLE & BULL. #1279

MAJOR BRAND: 12# to 15# Friction Pull. 800# to 1000# Cover Tensile. Heavy Duty. 28 oz. duck. 1/8" top x 1/32" bottom rubber covers. Tough cotton duck, strong carcass and proper flexibility. Used in moving boxes, bags, coal, sand, gravel, crushed stone, salt, earth and similar materials.

Width	Ply	U.S. Made Per Foot
14"	4	$3.06
16"	4	3.21
18"	4	3.56
20"	4	4.11
24"	4	4.81
30"	4	5.64
36"	4	6.89

MAJOR BEE BRAND: 16# to 19# Friction Pull. 2400# to 3000# Cover Tensile. Skim Coat Between Plies. A high grade of heavy duty 28 oz. duck, 1/8" top x 1/32" bottom rubber covers. For severe service and abrasion resistance. For stone, mineral ores, concrete, cement and coal.

Width	Ply	U.S. Made Per Foot	Imported Belt Per Foot
14"	4	$3.31	$3.17
16"	4	3.74	3.36
18"	4	4.14	3.73
20"	4	4.72	4.32
24"	4	5.35	4.86
30"	4	6.56	5.98
36"	4	7.95	6.95
24"	5	6.25	5.63
The Following Have 1/16" Top Rubber Cover x 1/32" Bottom Rubber Cover:			
12"	3		$2.41
18"	3		3.23
24"	3		4.24

BONDED® IDLERS & RETURN ROLLS

3-roll, 5" diameter Troughing Idlers for:			
14" belt	$19.75	24" belt	$22.75
16" belt	20.50	30" belt	23.85
18" belt	21.90	36" belt	24.90
20" belt	22.10	48" belt	27.50
1-roll, 5" diameter Return Rolls for:			
14" belt	$ 8.50	24" belt	$11.00
16" belt	9.00	30" belt	12.50
18" belt	9.50	36" belt	13.75
20" belt	10.00	48" belt	16.50

All steel. Interchangeable with other well-known makes. Furnished with replaceable pre-lubricated sealed ball bearings. Maintenance is negligible. **WRITE FOR BULLETIN #1138.**

CHUTE LINING

CHUTE LINING is of high-tensile, abrasion-resisting quality. Recommended for Chute and Launder Lining, Conveyor Belt Scrapers, Conveyor Skirt Boards, Die-Press or Bumper Stock Hoppers, Bins and other metal surfaces exposed to the action of abrasion materials.

BONDED SCALE AND MACHINE COMPANY

PHONE Days: Hickory 4-2186 **WRITE FOR FREE CATALOG AND PRICES** **PHONE Evenings: AX. 1-2213 or TEmple 7-4519**

110 BELLEVUE **Mfrs. of Conveyors, Conveyor Parts, Idlers, Vibrating Screens, Crushers, Feeders and Bucket Elevators** **COLUMBUS 7, OHIO**

CAR PULLERS
4-5 HP & 10 HP Vert. Elec. Link Belt

500 RR GONDOLA CARS
50 Ton Open Top & 70 Ton Covered

ELECTRIC AIR COMPRESSORS
9—Ingersoll-Rand, 3000', 2200', 1200' — 600'
3600' Joy 600 HP New 1958

DIESEL LOCO CRANE
25-ton Industrial Brownhoist with D13000 Cat. diesel & 60 ft. boom

DIESEL LOCOMOTIVES
7—25 ton, 4—45 ton, 1—65 ton, 2—70 ton, 1-80 ton, 2—100, 3—120 ton General Electric & G.M.
9—8, 12, 15 & 30-ton Plymouth

DUMP CARS
200—1½, 2, 5, 14 & 20 yds. cap.
22—30 yd. Clark Air Dump

STIFFLEG DERRICKS
36 ton Amer. 60' Boom
35 ton Amer. 80' Boom

JAW CRUSHERS, SINGLE SHAFT ROLLER BEARING
8" x 10", 9" x 24", 10" x 30", 10" x 36", 20" x 36", 24" x 36"

JAW CRUSHERS BLAKE TYPE
12" x 26", 13" x 24", 14" x 28", 18" x 36", 30" x 36", 48" x 60", 48" x 72", 66" x 84"

ROLL CRUSHERS
24" x 14", 30" x 14", 40" x 16" A.C Style "B"

CONE AND FINE REDUCTION CRUSHERS
2', 3', 4', 5½, 7 Symons Cone Crushers
10½S and 25½S Kennedy Van Saun
No. 1 Sturtevant Rotary Fine
46" Stedman Double Cage Disintegrator—Unused

VIBRATING SCREENS
3' x 12' Single Deck, 5' x 12' Double Deck, 6' x 12' Double Deck

CLASSIFYING AND WASHING EQUIPMENT
8' x 30' x 19' Dorr Double Rake Bowl Classifier
7' x 30' Eagle Log Washer
84" x 12' Telsmith Super Scrubber
12'0" Link Belt Dewatering Rotoscope—Unused
Conveyco Sand Drying Wheel
8 Compartment Conveyco Sand Classifying Tank.
10' Gayco Air Separators
30" x 18' Eagle Double Screw Coarse Material Classifier

600 HP — 16 IN. DREDGE
Steel Dredge, 65' Swinter, 2200 V Elec. Drive, 1000' Marine Cable, Amer. Manganese Pump

ROTARY DRYERS
5'6" x 60', 72" x 28', 6' x 50', 7' x 54', 8' x 80'

ROTARY KILNS
6' x 60', 7' x 120', 9' x 160'

GYRATORY PRIMARY
48" & 20" Traylor with motors
13", 16", 20", 30" Allis Chalmers
No. 11 McCully

PORTABLE CRUSHING AND SCREENING PLANTS
Lippman Grizzly King 20" x 30" Jaw, 30" x 18" Roll, 3' x 8' Screen
Cedar Rapids 20" x 30 Jaw, 36" x 12' Feeder D-6000 Diesel
Cedar Rapids 2A 15" x 24" Jaw w/Feeder
Cedar Rapids 2A 24" x 16" Roll, 3' x 8' Screen Case engine

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4 x 9 and 5 x 8 Kennedy Van Saun Air Swept
6' x 4' CIW, 6' x 8' Traylor, 5' x 5' Allis Chalmers
6' x 18' Allis Chalmers, 7' x 18' Patterson

HARDINGE CONICAL BALL MILLS
3' x 8", 3' x 24", 5' x 22" and 10' x 48"

ROD MILLS
4' x 11' Ruth 6' x 12' EPD Hardinge
7' x 15' Marcy Open End 300 HP Motor

HAMMERMILLS
24" x 24" Bagle
30" x 48" Gruendler 2XE
40" x 33" Cedar Rapids
42" x 36" Jeffrey Type "B" w/150 HP Motor
SXT-14 Pennsylvania Mogul 500 HP
HMH-64-NC Hammermills Inc. Non-Clog
36 x 45 and 53 x 60 Cedar Rapids Double Impeller Impack Breaker

WANTED TO BUY
Dryers, Kilns, Crushers, Rod & Ball Mills & Classifiers, Derricks, Locomotives, Air Compressors.

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LIMA 1201 SHOVEL FRONT HIGH LIFT
2½ cu. yd. Bucket
$6,000.00
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2—16' Mechanical Separators
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Both in excellent condition. Special price before being brought into our stock.

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One 60-inch used Raymond Pulverizer or equivalent.
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1947 Model 111M, 4 yd. Diesel Electric Power Shovel S/N 8877 complete on crawlers with 2 GE motors; 45' boom; located in Rhodell, W. Va. Make offer to
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80 ton Manley Testing Machine for testing floor & roof concrete slabs up to 40 inches width & up to 10-foot length including one compression tester for 6" x 12" concrete cylinder. In good condition. Price **$800.00**
Concrete Plank Co., Inc.
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1—¾ yd. Lima Model 34 Shovel Front
1—75'x24" trough type Farquhar Model 347 Conveyor
1—12 cu. ft. Hayward Orange Peel Bucket (new—unused)
1—25-ton G.E. diesel electric locomotive (std. ga.)
Rotary compressors—125 - 210 - 365 and 600 cfm. Sale or Rent

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SAUERMAN 1¼ cy. Dragscraper, 2-drum Sauerman roller brg. Hoist, Crescent bucket, 50 HP. motor, block, excellent. $3750.

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Crushing Equipment, Etc.

1—13"x30" Farrel-Bacon Type B Jaw Crusher.
1—10"x30" Champion R.B. Portable Crusher with new Murphy Diesel Engine.
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1—8"x10" Denver Steel Jaw Crusher with Motor.
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Lot New Spare Parts & Screens for 42" Fuller-Lehigh Mill.
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1—NEW Sutton Air Separator—Model BX-100.
1—3½ Yard Blaw-Knox Bucket, Size 734.

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2—Practically identical 2300 Volt dredges, 16x12 Amsco HCF pumps, 400 h.p. 503 rpm motor, complete with 60 h.p. 1,000 ft. electric cable, relatively new, good order, one poor condition but usable. Price: $60,000 each or $110,000 for both, as is, where is. Can be seen in operation near Amite, Louisiana.

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22-TON REAR DUMPS

EXCELLENT OPERATING CONDITION

FIVE - 46TD's
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140 GPM, 100 Ft. Head, Gorman-Rupp portable pumps, driven by air cooled Wisconsin gas engines type AAH, rated 9 HP at 2000 rpm.

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60,000 lbs. pull, Garwood horizontal drum truck type winches. Model 6M-823. Each winch has 300' of one inch diameter wire rope.

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Twin-Disc convertors, rated 150/275 HP at 1800/2400 rpm. These fit GM models; 4-71, 6-71, 210. Also Budas, Waukeshas, Cummins, etc.

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CEMENT PLANTS
OHIO & PENNA.

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1—Raymond #6669 High Side 6 Roll Mill with Flash Drying System, 200 HP motor, 7' dia. double whizzer, complete with cyclones and dust collector.
1—Dixie Non-Clog Mogul Hammermill #5040, 200 HP with 36" pan feeder.
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6—Vulcan 8' x 125', 8' x 100' Rotary Kilns, ⅝" shell.
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1—Vulcan 7' x 80' Rotary Dryer, ½" shell.

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3—Fuller Mills 46", screen type, with 75 HP motors.

Fuller-Kinyon Pumps

1—8" type B with 75 HP motor.
1—7" type H with 75 HP motor.
1—6" type E with 50 HP motor.
1—5" type H with 25 HP motor.
150'—8" Fuller Huron Airslide with Spencer Blower.

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1—Link Belt Peck Carrier, 24" x 24" buckets, 119' c.c.
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1—Link Belt 24" x 45" troughing belt conveyor.
1—Jeffrey 20" x 25' troughing belt conveyor.
1—Jeffrey Traylor 24" x 48" Pan Feeder.

Miscellaneous

4—IR Imperial Compressors 884 cfm @ 100 PSI.
3—IR Imperial Vacuum Pumps 4188 cfm.
12—Centrifugal Pumps 4" to 16" with motors.
15—Bucket Elevators 16—49' cc. continuous and centrifugal discharge, steel casings, drives and motors.
900'—6", 9", 12" and 16" screw conveyors.
20—Steel Hoppers and Bins, 30' x 12' x 15' to 6' x 10' x 12' structural steel supports.
6—American 8' Disc Filters
Scales, car pullers, motors, structural steel, etc.

Send for detailed circular.

BRILL EQUIPMENT COMPANY

35-59 Jabez Street Newark 5, N. J.
Tel.: Market 3-7420

3—10'x78' Dryers—2'3'4'5½'7' Symons and Telsmith Cone Crushers—3648-4042-4872 Jaw Crushers and smaller sizes—48" & 20" Gyratory Vibrating Feeders—other types of Feeders—Eagle Fine & Coarse Material Washers—Dixie Non Clog moving plate Hammermills—Asphalt Plants—Jaw—Cone—Gyratory—Roll Double and Triple—Hammermill and Impact Crushers—Ball—Rod—Tube Mills—Screening, Washing and Crushing Plants, Classifiers, Compressors, Conveyors, Cranes, Drills, Dump Cars, Dredges, Feeders, Hoists, Motors, Generators, Kilns, Dryers, Locomotives, Pumps, Screens, Shovels, Draglines, Transformers, Euclid Trucks.

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CAMP HILL, PENNA.

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8'x60'x½" Welded Rotary Kiln
6x120'x½" Vulcan Rotary Kiln
4'x35' Rotary Dryer. New Shell
4'x47'x5/16" Mosser Rotary Dryer
3'x3'x12' Horiz.; 4'x9'x12' Vert. Pluggers
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6'x25'; 6'x50' Louisville Rotary Dryers
8'8"x70' Ruggles Cole Dryer
8'x11' Traylor Ball Mill, Steel Lined
7'x24' Allis Chalmers Tube Mill
#5060 Dixie Mogul Hammermill
SX13 Penna Hammermills, 400 HP
Heil Patterson Crusher, 100 HP
Raymond #50 & #40 Impact Mills
36"x42" Koppers 2 Roll Crushers
36"x48"; 20"x6" Jaw Crushers
20"x40"; 30"x96"; 40"x84" Screens
535'—24" Troughing Belt Conveyor
Bucket Elevators 45' to 90' Centers
100 Steel Tanks, 1000 to 350,000 gal.

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HEAT & POWER CO. INC.
60 E. 42nd St. New York 17, N. Y.
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1—Raymond Super High Side 6 Roll Mill, #73612 complete with motors, fans, whizzer cyclone, piping (1952).

2—57" Fuller Lehigh Mills with 150 HP motors.

2—48" Fuller Lehigh Mills with 100 HP motors.

3—Fuller Kenyon Pumps 6" with motor drives.

2—10' x 80' Rotary Dryers, 1¼" shell.

6—8'6"x80' Rotary Dryers, 1¼" shell.

2—6'6" x 60' Rotary Dryers, ½" shell.

2—4½' x 5½' x 60' Rotary Dryers, ⅜" shell.

4—8' x 12' Feinc Rotary Vacuum Filters.

7—Dorr Thickeners 80' dia. and 40' dia. Belt Conveyors, Screw Conveyors, Apron Feeders, Bucket Elevators, etc.

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35-59 Jabez Street, Newark 5, N. J.

Tel.: Market 3-7420

(see our other liquidation ad)

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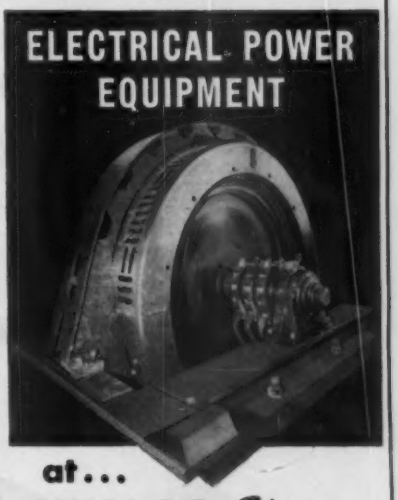

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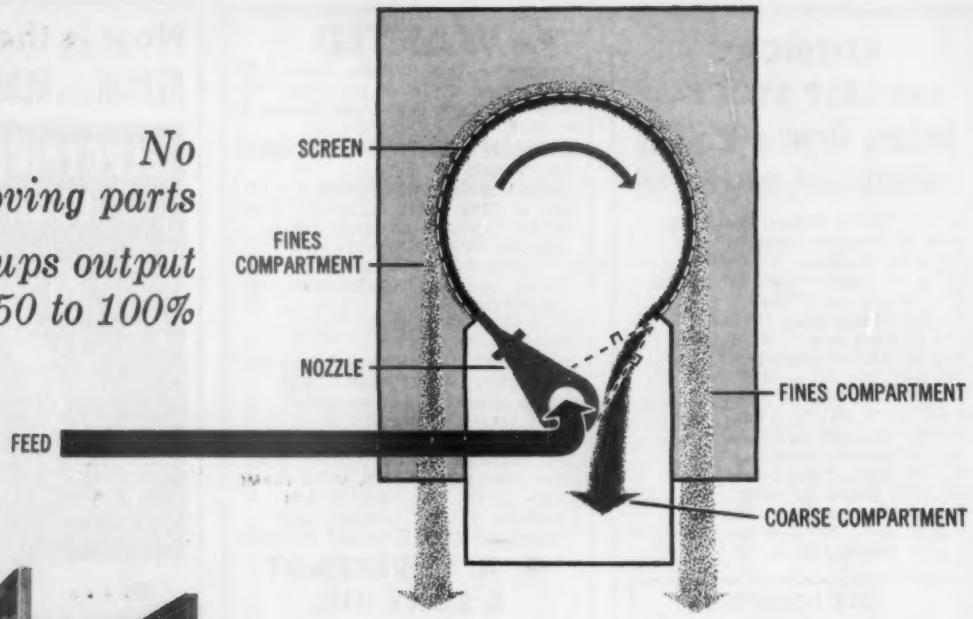

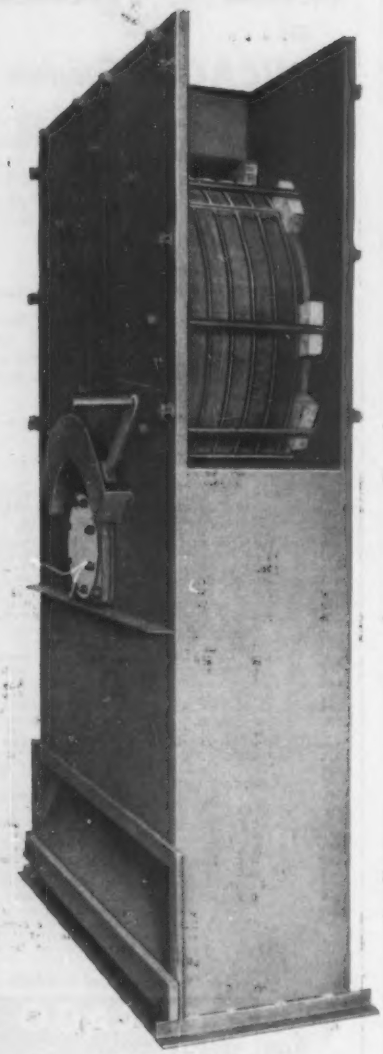

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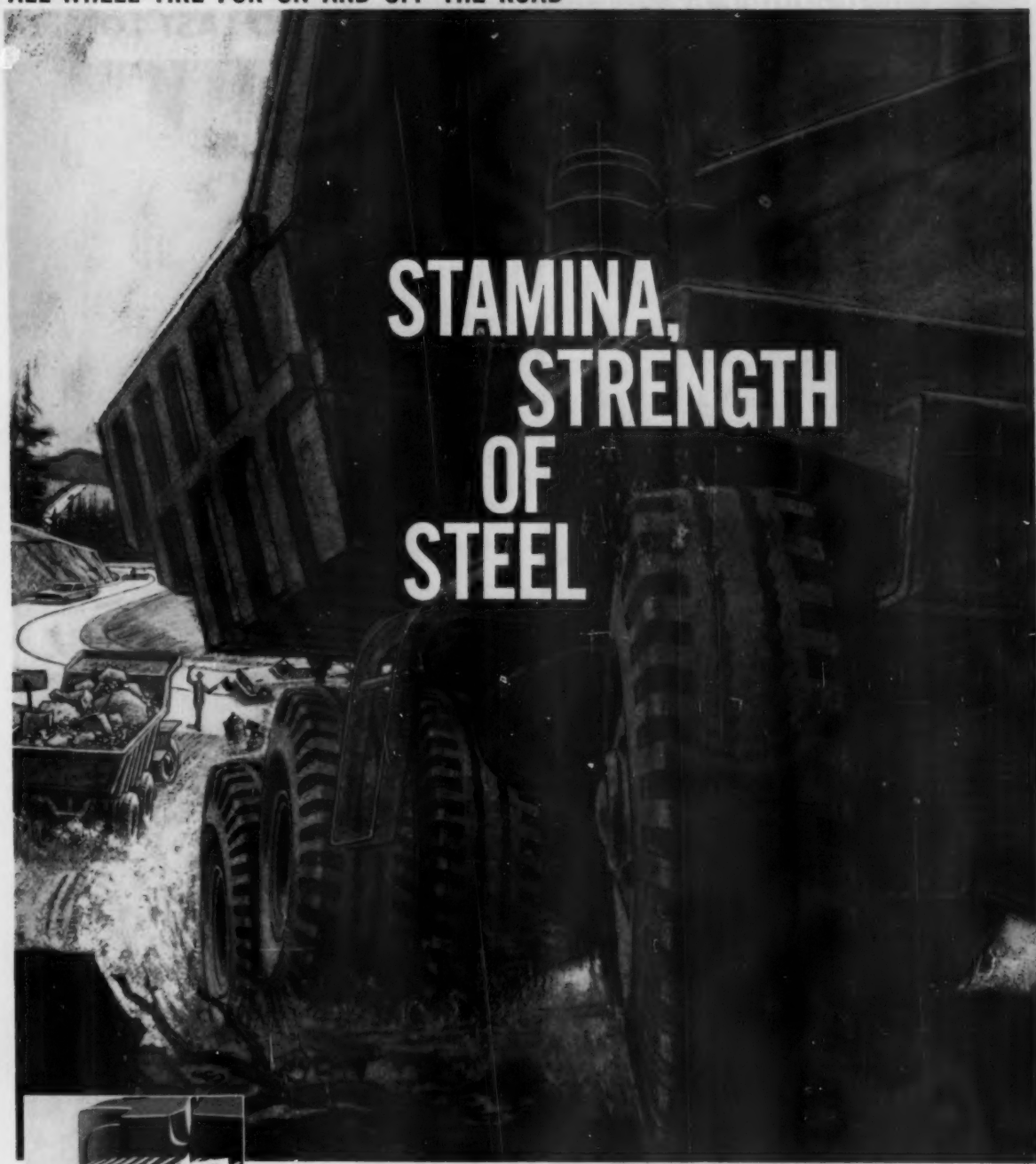

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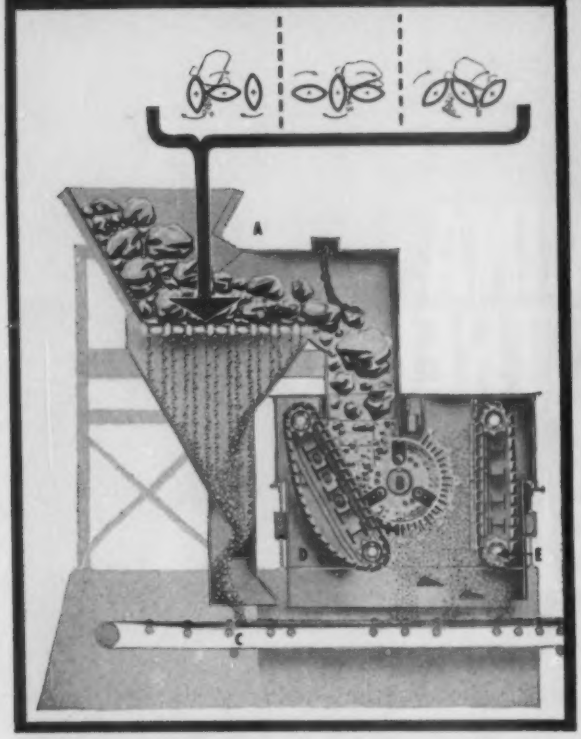

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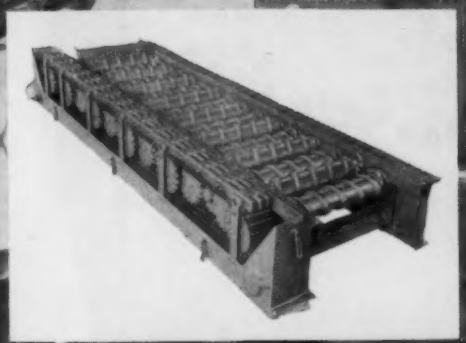

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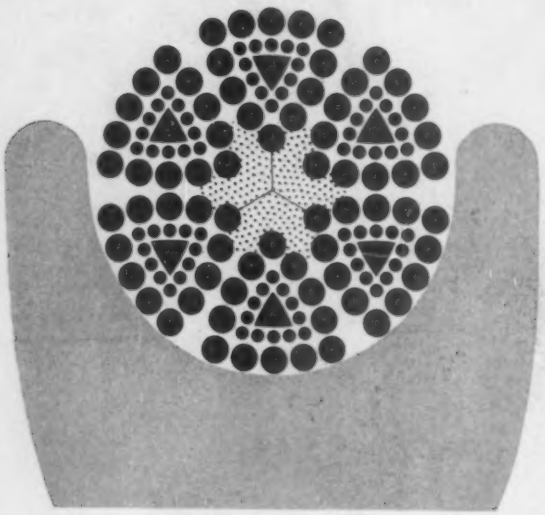

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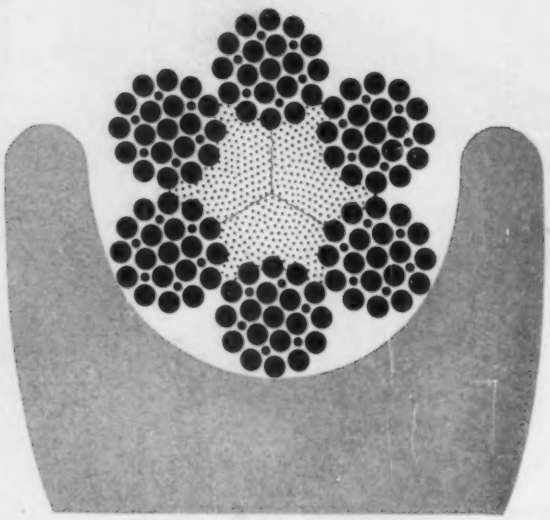

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Export Sales: Bethlehem Steel Export Corporation

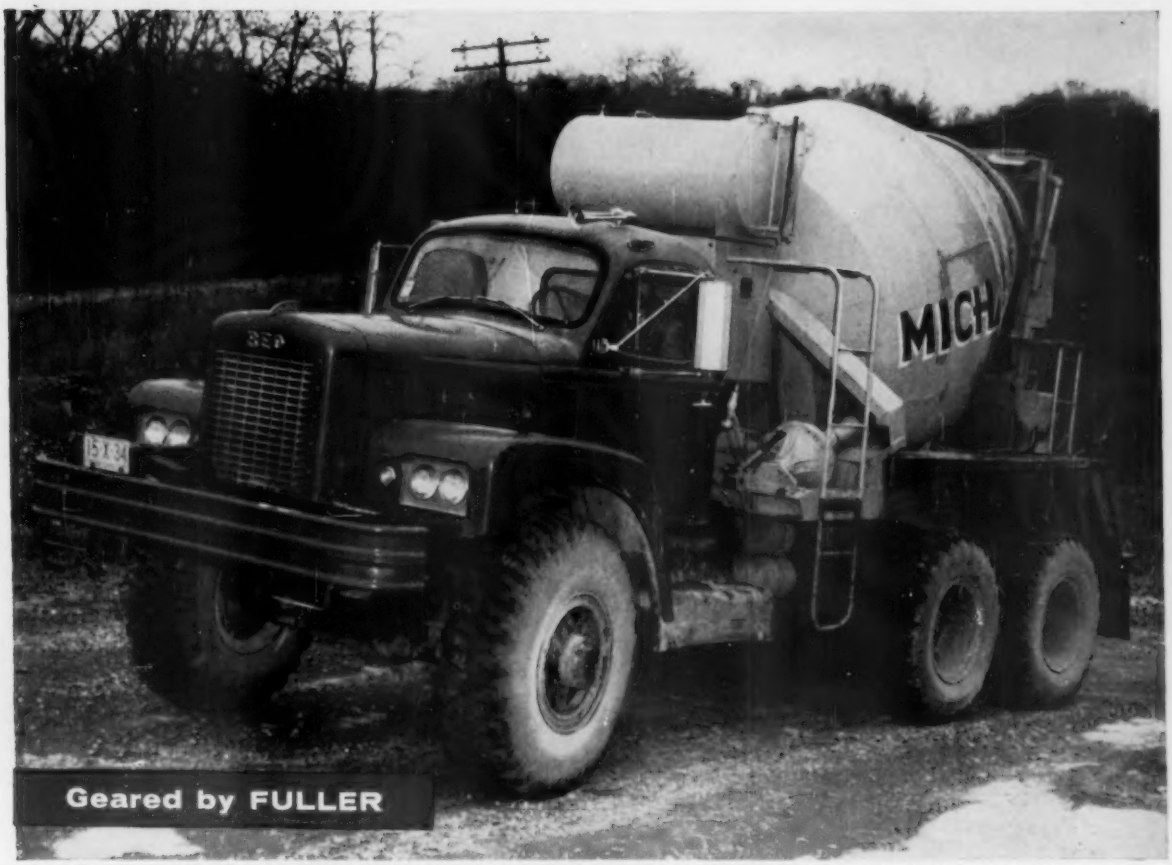
There's a distributor of Bethlehem Rope near you, supplied by our nationwide network of wire rope mill depots.

Steel

for Strength
. . . Economy
. . . Versatility

BETHLEHEM STEEL

BETHLEHEM STEEL



One of Michael's Fuller-equipped Reo F-505 6 x 6 OH Transit Trucks. The power is transmitted through a Fuller R-35 7-speed ROADRANGER to a 2.55:1/1.00:1 transfer case and 7.59:1 front and 7.54:1 rear axles.

R-35 ROADRANGERS from Pit to Patio

"We have more than doubled our business in the last three years," Vern Michael, owner of Michael Concrete Products, Inc., Loveland, Ohio, says. "Since we bought our first big Fuller-equipped Reo in 1957, our trucks always come through on deliveries. That Fuller R-35 ROADRANGER Transmission should be given a major portion of the credit for this performance. It has the get-up-and-go we need to get thru the rough construction sites where we operate."

Fuller R-35 RoadRanger features:

- No gear splitting — 7 selective and progressive gear ratios
- Easier, quicker shifts — closely spaced and equal ratios in the operating range
- One shift lever controls all 7 forward and 1 reverse speeds
- Engines work in peak hp range with greater fuel economy
- Compact transmission—only 375 lbs., 26-25/32 inches in length

RATIOS

Gear	Std.*	Opt.**	% Step
Seventh	1.00	1.00	*33 24**
Sixth	1.33	1.24	34.8
Fifth	1.79	1.67	34.8
Fourth	2.42	2.25	36.5
Third	3.30	3.06	48.6
Second	4.90	4.55	67.3
First	8.20	7.62	
Reverse	7.63	7.09	

Weight . . . . 375 lbs.
Oil Capacity . 16 pts.

FULLER TRANSMISSION DIVISION
EATON MANUFACTURING COMPANY
KALAMAZOO, MICHIGAN

Sales & Service: West. Dist. Branch, Oakland 6, Cal. • Southwest Dist. Office, Tulsa 3, Okla. • Automotive Products Co., Ltd., Brock House, Langham St., London W.1, England, European Rep.

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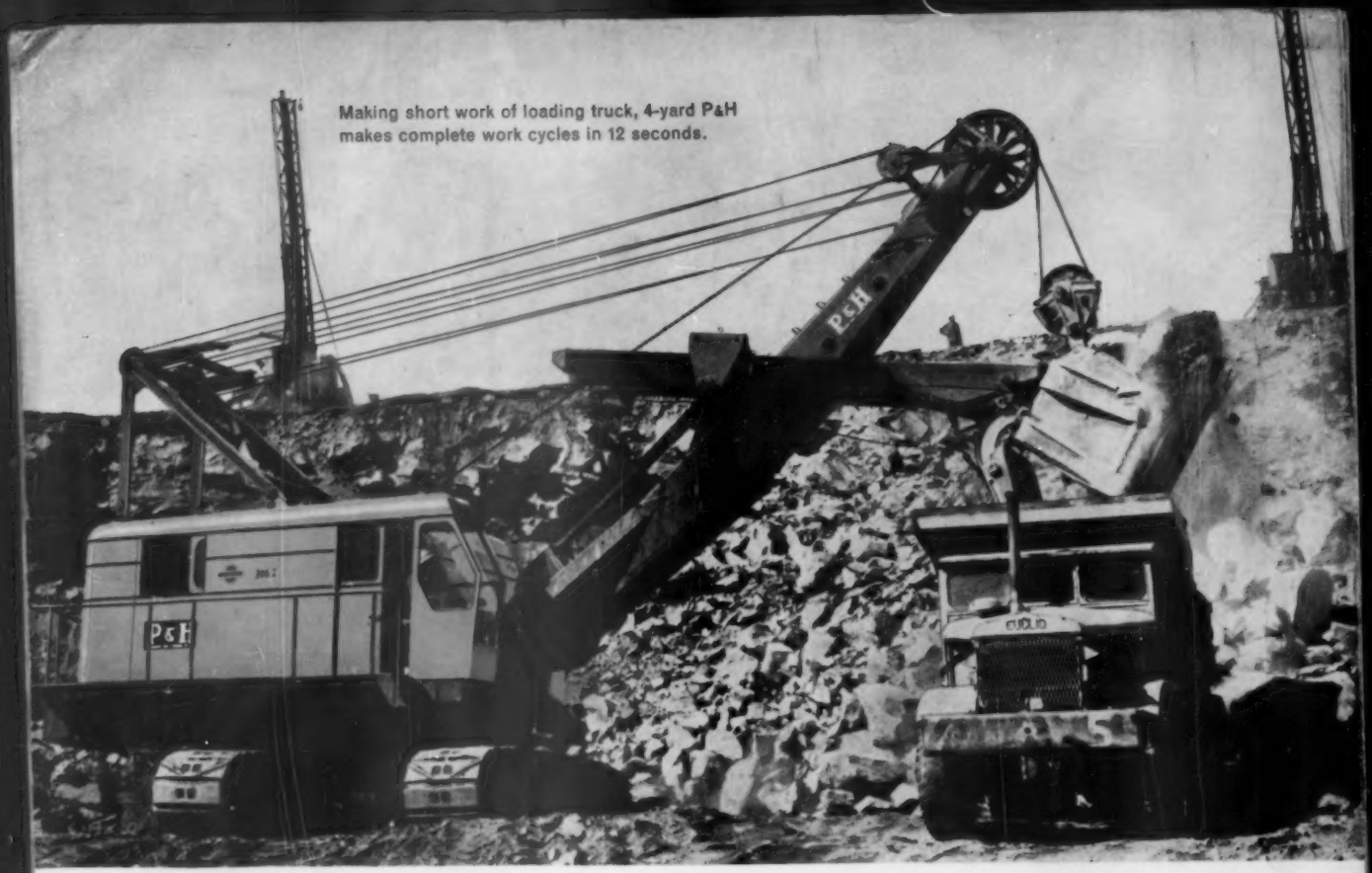

Making short work of loading truck, 4-yard P&H makes complete work cycles in 12 seconds.

Magnetorque swingers are the reason . . .

"4 yard P&H out-produces two 2½ yard shovels"

. . . STOCKBRIDGE STONE COMPANY, Atlanta, Georgia
Division of VULCAN MATERIALS COMPANY

Powerful P&H handles heavy rock with tireless ease as it works 16 hours a day digging and loading shot rock.

J. G. Lambert, Superintendent, has this to say about his operation— *"Our 4 yard P&H shovel, with Magnetorque swingers, accounts for more than half of the yardage produced at our Fortson quarry. It actually produces more than both of our other 2½ yard shovels combined."*

12 to 15 seconds work cycles. Stockbridge Stone supplies aggregate throughout Georgia, Alabama, and to four company-owned plants that manufacture concrete blocks and ready-mix. Of prime importance to them is the speed and dependability with which their shovels can excavate rock and load trucks to keep their processing plants in production. This company reports that their P&H shovel loads 18-ton trucks in 5 or 6 passes with work cycles averaging 12 to 15 seconds.

Edward Pitts, operator of the P&H says that Magnetorque swingers are the reason he gets better than 25% faster work cycles. He points out that Magnetorque swingers, unlike friction-type clutches, never over heat, and are not affected by temperature changes or load size.

P&H works two 8 hour shifts per day. To meet the heavy demand for aggregate, Stockbridge operates their 4-yard P&H shovel on a 16-hour day . . . and they operate in all types of weather, even the heaviest rains. This company has proven to itself that P&H delivers exceptional performance under the most rigorous conditions—steady, fast cycles with no downtime other than normal preventive maintenance.

Another feature, "Bud" Lambert stresses, is the propel brake on the P&H—this brake control gives more productive working time because it eliminates the constant need to "dog" or "undog" the machine with clumsy jaw clutches for every move.

For more information on this job, write for Case History 136.

HARNISCHFEGER P&H
Milwaukee 46, Wisconsin

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